1076832

Date

Name
Address
City ST Zip

Subject: Troy Asbestos Property Evaluation

Dear :

The Montana Department of Environmental Quality (DEQ), in consultation with the United States Environmental Protection Agency (EPA), and Tetra Tech EM Inc (TtEMI) (an environmental consulting firm retained by DEQ) plan to conduct an Asbestos Property Evaluation for properties in the Troy area this summer. This investigation is a part of the larger asbestos clean up activities currently occurring in Libby.

Pursuant to Section 104(b) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §9604(b), DEQ requests access to your property located at **********, Troy. The investigation will include inspection and photodocumentation as needed of all areas (living spaces, walls, basements, attics, etc.) inside buildings on the property and outside of the buildings. DEQ will also collect soil, building material, and dust samples from the buildings and around the property. We will be looking for any vermiculite-contaminated insulation or other building materials and vermiculite contaminated soils. The information collected during this investigation will determine the need for any future cleanup of vermiculite contamination on your individual property.

DEQ would like to conduct these activities in cooperation with you and is providing you a request to obtain access. This is also an opportunity for you to raise any specific questions or concerns. Please feel free to use any of the following resources to obtain additional information or ask any questions you may have.

- Catherine LeCours, DEQ Project Officer, phone toll free 1-800-246-8198 or e-mail at clecours@mt.gov
- EPA Information Center in Libby - 501 Mineral Ave, phone toll free at 1-888-420-6810, or visit the Center Monday through Friday from 8:30 a.m. to 5:00 p.m.
- City Hall in Troy - 301 E. Kootenai, available Monday through Friday from 8:00 a.m. to 5:00 p.m.
- On the Internet at http://www.epa.gov/region8/superfund/libby.html

Two copies of a "Consent for Entry and Access to Property" form are enclosed. Please review, sign one and return it to me in the enclosed envelope no later than ****date****. DEQ will then contact you to schedule the inspection at your convenience.

The Troy Asbestos Property Evaluation is part of the Libby Asbestos Superfund Site process and is being conducted under a cooperative agreement between DEQ and EPA. Please feel free to contact me at the numbers above with any questions or concerns.

Sincerely,

Catherine LeCours
Superfund Project Manager
Remediation Division

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2 access agreements

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Deleted: Entry and access to property for sampling and investigation is authorized under Section 104(e).¶
¶

Deleted: I can be reached at 1-800-246-8198, 406-841-5040 or electronically at clecours@state.mt.us.¶

Date

Name
Address
City ST Zip

Subject: Troy Asbestos Property Evaluation

Dear :

The Montana Department of Environmental Quality (DEQ), in consultation with the United States Environmental Protection Agency (EPA), and Tetra Tech EM Inc (TtEMI) (an environmental consulting firm retained by DEQ) plan to conduct an Asbestos Property Evaluation for properties in the Troy area this summer. This investigation is a part of the larger asbestos clean up activities currently occurring in Libby.

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- EPA Information Center in Libby - 501 Mineral Ave, phone toll free at 1-888-420-6810, or visit the Center Monday through Friday from 8:30 a.m. to 5:00 p.m.
- City Hall in Troy - 301 E. Kootenai, available Monday through Friday from 8:00 a.m. to 5:00 p.m.
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Sincerely,

Catherine LeCours
Superfund Project Manager
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MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
1100 NORTH LAST CHANCE GULCH
PO BOX 200901
HELENA MT 59620

CONSENT FOR ENTRY AND ACCESS TO PROPERTY

Name: _____

Address: _____ Phone (home): _____
_____ (work): _____
_____ (cell): _____

Address of Property for which consent for entry and access is being granted:

_____
_____
_____

Relationship to property: _____
(i.e., owner, owner's representative, tenant, etc.)

I, the undersigned, am the owner, their representative, or otherwise control the real property at the location described above. The State of Montana's Department of Environmental Quality (DEQ) and the United States Environmental Protection Agency (EPA) has requested entry and access to my property pursuant to its response and enforcement responsibilities under the Comprehensive Environmental Response, Compensation and Liability Act as amended (Superfund), 42 U.S.C. 9601 et seq.

I consent to officers, employees, and authorized representatives of the DEQ and EPA, including their authorized contractors, entering and having continued access to my property for the following purposes:

1. Visually inspecting and photographing the property, including the interior and exterior of any home or any other structures on the property;

2. The taking of such soil, building material, or dust samples as may be determined to be necessary;

3. The taking of actions to mark or temporarily cover exposed vermiculite.

_____ _____
Signature Date

STATE OF MONTANA
DEPARTMENT OF ENVIRONMENTAL QUALITY
1100 NORTH LAST CHANCE GULCH
PO BOX 200901
HELENA MT 59620

CONSENT FOR ENTRY AND ACCESS TO PROPERTY

Name: _____

Address: _____ Phone (home): _____
_____ (work): _____
_____ (cell): _____

Address of Property for which consent for entry and access is being granted:
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_____
_____

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3. The taking of actions to mark or temporarily cover exposed vermiculite.

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_____ _____
Signature Date

DRAFT

TROY ASBESTOS PROPERTY EVALUATION WORK PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN)

FOR THE

TROY ASBESTOS PROPERTY EVALUATION PROJECT

Troy Operable Unit of the Libby Asbestos Superfund Site

March 2006

Prepared for:

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Remediation Division
P.O. Box 200901
Helena, Montana 59620

Contract Number 402014
Contract Task Order Number 41

Prepared by:

TETRA TECH EM INC.
Power Block Building, Suite 612
7 West 6th Avenue
Helena, Montana 59601
(406) 442-5588

DRAFT

TROY ASBESTOS PROPERTY EVALUATION WORK PLAN (FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN)

FOR THE

TROY ASBESTOS PROPERTY EVALUATION PROJECT

Prepared for:

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

REVIEWS AND APPROVALS

Tetra Tech EM Inc. Project Manager: _____ Date: _____
J. Edward Surbrugg, Ph.D.

DEQ Project Officer: _____ Date: _____
Catherine LeCours

EPA Remedial Project Manager: _____ Date: _____
Peggy Churchill

DISTRIBUTION LIST

Name	Responsibility	Affiliation
Catherine LeCours	Remedial Project Officer	Montana Department of Environmental Quality – Helena, Montana
J. Edward Surbrugg	Tetra Tech Project Manager	Tetra Tech EM Inc. – Helena, Montana
Peggy Churchill	EPA Remedial Project Manager	EPA – Denver, Colorado
Mike Cirian	EPA Remedial Project Manager	EPA – Libby, Montana
Jeff Montera	CDM Libby Project Manager	CDM – Denver, Colorado
Mark Raney	Volpe Libby Technical Lead	Department of Transportation, Volpe Center – Cambridge, Massachusetts
Pat Carnes	Volpe Libby Database Project Manager	Department of Transportation, Volpe Center – Cambridge, Massachusetts
Terry Crowell	CDM Libby Sample Coordinator	CDM – Libby, Montana

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Appendix

FIGURES

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TABLES

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ACRONYMS AND ABBREVIATIONS

AHERA	Asbestos Hazard Emergency Response Act
amsl	Above mean sea level
ASTM	ASTM International (formerly the American Society for Testing and Materials)
CDM	Camp Dresser & McKee
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
cm^2	Square centimeters
CPR	Cardiopulmonary resuscitation
DEQ	Montana Department of Environmental Quality
DPHHS	Montana Department of Public Health and Human Services
DQO	Data quality objective
eLastic	Electronic Libby Asbestos Sample Tracking Information Center
EPA	U.S. Environmental Protection Agency
FSDS	Field sampling data sheet
GPS	Global positioning system
HASP	Health and safety plan
HAZWOPER	Hazardous waste operations
IFF	Inspection field form
LA	Libby amphibole
Microvac	Microvacuum
mm	Millimeters
OSHA	Occupational Safety and Health Administration
OU	Operable unit
PPE	Personal protective equipment
PLM	Polarized light microscopy
QA	Quality assurance
QC	Quality control
SOP	Standard operating procedure
TAPE	Troy Asbestos Property Evaluation
Tetra Tech	Tetra Tech EM Inc.
µm	Micrometers

ACRONYMS AND ABBREVIATIONS
(continued)

VCI	Vermiculite-containing insulation
Volpe Center	John A. Volpe National Transportation Systems Center

1.0 PROJECT DESCRIPTION AND BACKGROUND

Tetra Tech EM Inc. (Tetra Tech) received Task Order No. 41 from the Montana Department of Environmental Quality, Remediation Division (DEQ), under DEQ Contract No. 402014. The purpose of this task order is to complete a Troy Asbestos Property Evaluation (TAPE) Work Plan for the Troy Operable Unit (OU) of the Libby Asbestos Superfund Site. The United States Environmental Protection Agency (EPA) is the lead agency for the Libby Asbestos Superfund Site. DEQ is the lead agency for the Troy OU through a Cooperative Agreement with EPA. EPA requested DEQ lead the Troy OU for financial savings and resource allocation. The TAPE Work Plan describes the field and property inspections and sample collection necessary to identify if and where asbestos is present within the Troy OU and the concentrations and quantity, if present. This information will be used at a later date to support cleanup decisions.

This TAPE Work Plan document is a combined field sampling plan and quality assurance project plan and is referred to as the TAPE Work Plan. Tables and figures in this document follow the first reference in the text. Appendix A contains the site-specific health and safety plan (HASP), Appendix B contains copies of project-applicable standard operating procedures (SOPs), Appendix C is a list of equipment and supplies required for the project, Appendix D contains samples of information for residents, and Appendix E contains example TAPE project field forms.

1.1 PROJECT BACKGROUND AND PURPOSE FOR SAMPLING

Troy, Montana, is located 18 miles northwest of Libby, Montana. From the 1920s until 1990, an active vermiculite mine and associated processing operations were located at Libby. While it was in operation, the vermiculite mine in Libby may have produced 80 percent of the world's supply of vermiculite (EPA 2005). Vermiculite is used primarily for insulation in buildings and as a soil amendment. The vermiculite deposit is contaminated with a form of amphibole asbestos (Libby amphibole [LA]) that is considered a carcinogen. Asbestos is a known carcinogen and is associated with a multitude of respiratory health effects, including asbestosis, lung cancer, and mesothelioma. For decades, vermiculite ore and waste materials were ubiquitous in the Libby community while the mine operated and after its closure.

In 1999, EPA Region 8 dispatched an emergency response team to investigate in response to media reports that described a high rate of asbestos-related deaths in Libby. The Agency for Toxic Substances and Disease Registry (ATSDR) has since determined that between 1978 and 1998 asbestosis mortality in

Libby was 40 times to 80 times higher than expected in Montana and the United States, and lung cancer mortality was approximately 20 percent to 30 percent higher than expected in Montana and the United States (ATSDR 2002). Originally believed to be a problem limited to the mine workers, the scope has increased. Subsequent environmental investigations have found many areas in and around Libby contaminated with LA. EPA began Time Critical Removal Actions in Libby in 1999. EPA began investigations in Libby through a two-phased approach. The Phase I investigation was used to determine if a time critical removal action was warranted in Libby to protect human health, to identify potential major source areas, and to identify the appropriate analytical methods for measuring concentrations of LA in those source materials (CDM 2002). The Phase II investigation was used to collect detailed information about airborne concentrations in air that result from sources of contamination that are disturbed (CDM 2003b). The combined results from the Phase I and II investigation include:

- Exposure to LA is a threat to human health.
- Release of respirable LA fibers occurs when source materials are disturbed.
- Source materials include vermiculite insulation, vermiculite products (building materials) and process wastes, and contaminated soils.
- Contaminated indoor dust found in residential and commercial properties is a potential exposure pathway.
- There is widespread presence of LA throughout the Libby area.

As a result of the findings from the Phase I and II investigations, and because the Libby Asbestos Superfund Site was listed on the National Priorities List in 2002, a further investigation of residences and businesses in the Libby study area boundary was warranted (EPA 2003b). EPA began the Libby Asbestos Superfund Site Contaminant Screening Study, which was considered the first part of the Remedial Investigation, in 2002. The goal of the Contaminant Screening Study was (and is) to determine which properties in Libby contained LA source materials (CDM 2003a). As of December 2005, EPA and their contractors have investigated 4,029 properties in the Libby area through the Contaminant Screening Study.

The purpose of the TAPE is identical to that of the Contaminant Screening Study. The Troy Site Conceptual Model (Section 1.2) illustrates that potential exposures in Troy are similar to those in Libby, therefore, a systematic screening of Troy area residences and business is necessary to gather sufficient information to determine how many Troy area properties are contaminated with LA. Some vermiculite

mine workers lived in Troy and commuted to the mine to work each day. The mine workers were exposed to asbestos-contaminated materials at the mine and processing facilities, and they transported asbestos-contaminated dust to their homes on clothes and equipment. Residents of Troy also traveled to Libby for everyday activities such as shopping, working (other than at the mine), and attending school sporting events and likely came in contact with LA in Libby during these frequent visits. In addition, the asbestos-contaminated vermiculite ore and waste materials in varying forms may have been used for amending soils (as fill or as a conditioner), building materials (plaster, concrete, or chinking amendment), and for insulating buildings in and around Troy.

Properties in Troy are being investigated to evaluate whether sources of LA contamination exist at these properties. Limited investigations thus far have found the vermiculite insulation found in Troy is morphologically similar to that in Libby.

1.2 SITE CONCEPTUAL MODEL

Asbestos exposure is a potential human health concern because chronic inhalation of excessive levels of asbestos fibers suspended in air can result in lung diseases such as asbestosis and mesothelioma. The relationship between asbestos exposure and mesothelioma has been documented, and at least 70 percent of people with mesothelioma report that they have been exposed to asbestos (National Cancer Institute 2005). Figure 1-1 presents a draft Site Conceptual Model for Troy, which identifies exposure pathways by which asbestos fibers from the Libby mine might be inhaled or ingested by humans. The draft Site Conceptual Model will be refined as additional data are acquired and the understanding of actual transport and exposure pathways for Troy is improved. EPA, CDM, and the Montana Department of Public Health and Human Services (Montana DPHHS) have provided additional related background information for the Libby asbestos project and on mesothelioma in Montana (CDM 2003; Montana DPHHS 2005).

1.3 TROY SITE INFORMATION

The Troy OU is located along the Kootenai River valley at an elevation ranging from 1,850 feet above mean sea level (amsl) at the northern end of the OU to 2,500 feet amsl on the mountain slopes surrounding the valley. The Troy OU is approximately 8 miles long and up to 1.8 miles wide. Topography of the Troy OU consists of relatively flat river valley terraces on both sides of a gently graded Kootenai River. Several tributaries flow into the Kootenai River along the 8-mile stretch contained within the Troy OU. Figure 1-2 provides a topographic view of the Troy OU boundaries.

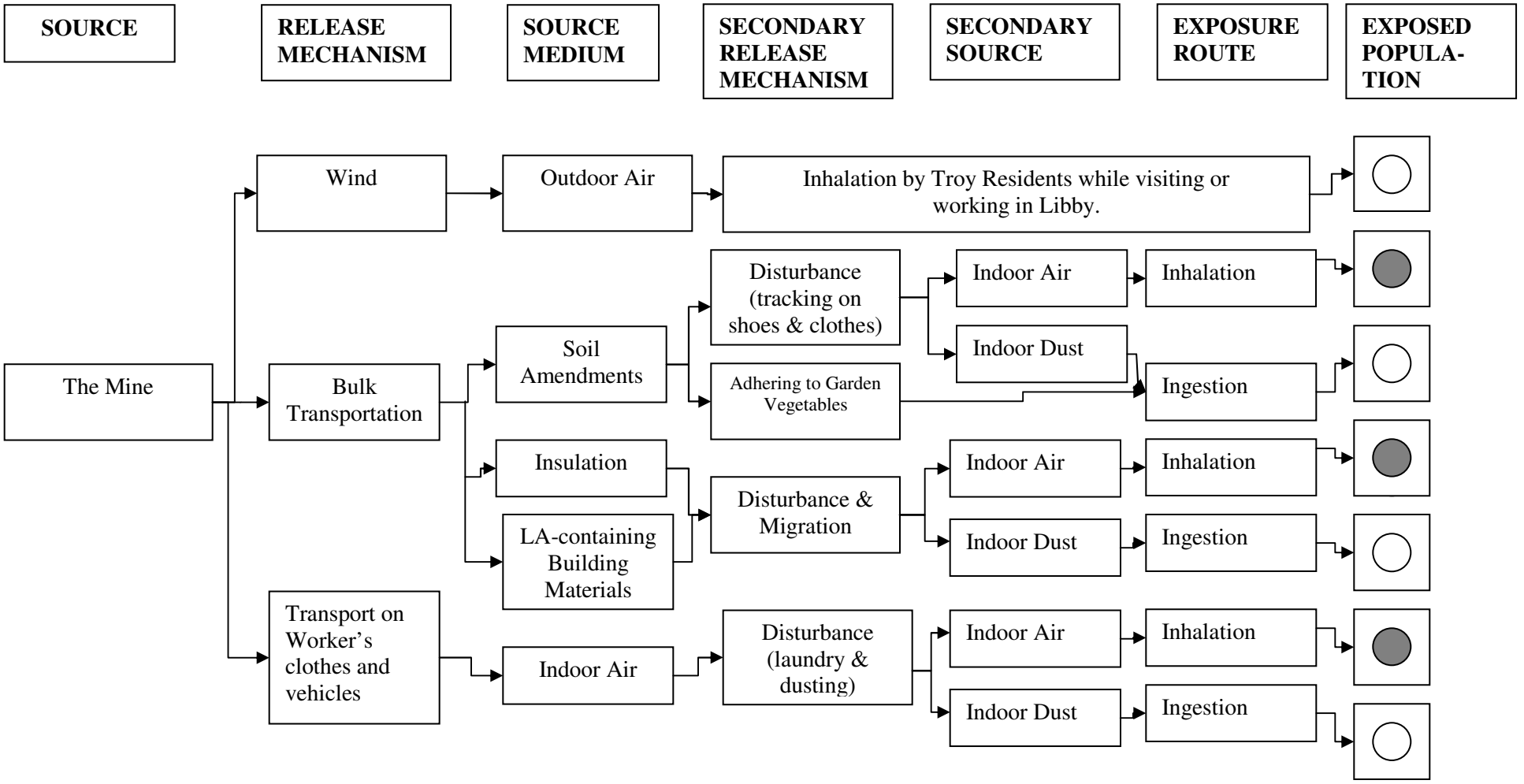

Figure 1-1: Site Conceptual Model – Potential Human Exposure Pathways to Asbestos at the Troy Operable Unit, Libby MT Superfund Site

Figure 1-2: Topographic View of the Troy OU

1.4 SCHEDULE

The schedule for the TAPE inspection and sampling field work is pending DEQ receiving adequate EPA funding. The TAPE field work may begin in the summer 2006 and would require approximately 75 full work-days to complete (15 weeks) based on an average of 15 total TAPE inspections per full day. The soil and dust samples collected from the TAPE field work will be prepared for analysis by CDM and analyzed for asbestos concentrations by a contract laboratory. Analysis of the samples is also dependent upon adequate EPA funding. Tetra Tech will prepare a TAPE Field Summary Report approximately 90 days after the completion of the field work. The draft TAPE project report would be submitted to the DEQ and others approximately 60 days after receiving the analytical data.

1.5 REPORT ORGANIZATION

This TAPE Work Plan is organized into eight sections. Section 1.0 is this introduction. The contents of Sections 2.0 through 8.0 are briefly described below.

- Section 2.0 Project Organization. This section identifies key project personnel and project responsibilities and provides an organizational chart and a table of participants with contact information.
- Section 3.0 Work Plan Rationale. This section describes the data quality objective (DQOs) steps used to establish the quantity and the quality of data to support decision making.
- Section 4.0 Field Procedures. This section describes the activities that will take place during the property evaluations. The SOPs for each activity and the HASP are referenced and detailed.
- Section 5.0 Field Quality Control Procedures: This section discusses the field quality assurance and quality control (QA/QC) procedures, including equipment decontamination, QA samples, field documentation, and chain of custody. Also discussed in this section are QA procedures used at the Libby Asbestos Superfund Site (EPA 2000c).
- Section 6.0 Data Management. This section describes how the data will be handled after they have been received from the Libby V2 database.
- Section 7.0 QA/QC Procedures. This section will describe the procedures that will be taken to ensure the quality and integrity of the TAPE data.

Finally, references used in preparing this document are presented in Section 8.0.

2.0 PROJECT ORGANIZATION

Table 2-1 presents the responsibilities and contact information for key personnel involved in the TAPE inspection and sampling project. In some cases, more than one responsibility has been assigned to a person.

The John A. Volpe National Transportation Systems Center (Volpe Center) is providing support to EPA Region VIII, including management of the Libby V2 database which is used to track sampling, analytical, and other pertinent data from the Libby Asbestos Superfund Site. Tetra Tech will transfer Troy data to and obtain data from EPA and their contractors. Tetra Tech will transfer custody of all soil and dust samples to CDM after the samples have been recorded and organized. CDM will then be responsible for custody and quality assurance of the samples until delivery to a contract laboratory for analysis. CDM contracts all analytical laboratories used for the Libby Asbestos Superfund Site. Therefore, CDM will oversee laboratory schedules and track data deliverables.

2.1 MONTANA DEQ OVERSIGHT

The DEQ Project Officer (or designee) will provide oversight of all field activities associated with this TAPE project. DEQ oversight personnel will have the ability to inspect all field and sampling activities, determine the appropriateness of the recorded data, and ensure that all activities comply with standard practices that meet the project objectives. Before any oversight is conducted, the Tetra Tech on-site health and safety coordinator will brief the DEQ oversight personnel to ensure safe practices are maintained throughout the TAPE field effort.

2.2 NON-AGENCY OBSERVATION OF FIELD ACTIVITIES

EPA will be allowed the opportunity to observe the TAPE project field activities. The request for non-Agency observation of field activities must first be coordinated with and approved by the DEQ Project Officer and property owner. When inspection and sampling are being conducted on a Troy property and the owners are present, the property owners will have the opportunity to (1) observe Tetra Tech field inspection and sampling, (2) obtain copies of the field forms and property sketches completed for the property, (3) obtain a receipt for samples collected, and (4) obtain a portion of samples collected (at the cost of the property owner). The Tetra Tech field team will brief property owners about the types of sampling and methods for completing the TAPE inspection and sampling; however, the Tetra Tech field

team will not interpret results or make conclusions from the inspection and sampling for the property owner.

If Tetra Tech obtains soil or dust samples at a property, Tetra Tech will, if requested, provide the property owner with a receipt for the samples identifying the number and types of samples collected before the field crew leaves the property. No sample results will be available during the TAPE inspection and sampling. An individual property owner who requests a portion of a sample must supply all necessary materials required for sampling, as well as arrange and pay for laboratory analysis of all additional samples collected.

2.3 SPECIAL TRAINING AND CERTIFICATES

Tetra Tech personnel who work on the TAPE project will have met the Occupational Safety and Health Administration (OSHA) training requirements defined in Title 29 Code of Federal Regulations (29 CFR) Part 1910.120(e) for working on hazardous waste sites. These requirements include: (1) 40 hours of formal off-site instruction; (2) a minimum of 3 days of actual on-site field experience under the supervision of a trained and experienced field supervisor; and (3) 8 hours of annual refresher training. In addition, all Tetra Tech personnel working on the TAPE project will have taken the Asbestos Hazard Emergency Response Act (AHERA) 24-hour asbestos inspector training course and will hold a current asbestos inspector license issued by the State of Montana.

Tetra Tech personnel working on the TAPE project must read and abide by the stipulations and guidelines set forth in Tetra Tech's HASP, which is Appendix A to this TAPE Work Plan. The HASP provides written instructions for health and safety training requirements, personal protective equipment (PPE) requirements, spill containment program, and health-hazard monitoring procedures and techniques. At least one member of every Tetra Tech field team will maintain current certification in the American Red Cross "Multimedia First Aid" and "Cardiopulmonary Resuscitation (CPR) Modular" or equivalent.

Copies of Tetra Tech's health and safety training records, including course completion certifications for the initial and refresher health and safety training, specialized AHERA training, and first aid and CPR training, are maintained in the Helena Tetra Tech office files for all TAPE field team members.

TABLE 2-1

KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
Catherine LeCours	DEQ	Project Officer	• Monitors performance of the contractor • Reviews and approves QA measures • Consults with the EPA and Volpe • Reviews and approves all work plans (FSP/QAPP) • Provides coordination with EPA, Volpe, and CDM • Provides primary interface with the Troy community and disseminate project information to the public	Montana Department of Environmental Quality PO Box 200901 Helena, MT 59620-0901 clecours@mt.gov (406) 841-5040
J. Edward Surbrugg	Tetra Tech	TAPE Project Manager	• Responsible for implementing all activities called out in the task order • Supervises preparation of work plan and approves document • Monitors and directs field activities to ensure compliance with work plan requirements • Provides coordination with DEQ Project Officer • Disseminate project information to interested parties and Troy property owners and direct questions to DEQ	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 edward.surbrugg@ttemi.com (406) 442-5588
Mark Stockwell	Tetra Tech	- TAPE Field Team Leader - TAPE QA/QC Manager	• Responsible for directing and coordinating day-to-day field activities conducted by Tetra Tech • Verifies that field sampling and measurement procedures follow work plan • Conducts field audits for QA/QC • Provides DEQ Project Officer and TAPE project manager with regular reports on status of field activities • Disseminate project information to interested parties and Troy property owners and direct questions to TAPE project manager or DEQ	Tetra Tech, Sandpoint 7 West 6th Avenue Sandpoint, ID mark.stockwell@ttemi.com (208) 263-4524

TABLE 2-1
(Continued)

KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
Jessica Allewalt	Tetra Tech	Troy Field Data Coordinator	• Responsible for working with TAPE project manager and TAPE field team leader to schedule TAPE inspections • Responsible for compiling, organizing, and auditing field data sheets and samples submitted daily by field teams • Responsible for transferring field data sheets and samples to the CDM Troy Sample Coordinator • Coordinate with CDM, EPA, and Volpe managers on sample delivery schedules and logistics • Reviews laboratory data before release to project team • Disseminate project information to interested parties and Troy property owners and direct questions to TAPE project manager or DEQ	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 jessica.allewalt@ttemi.com (406) 442-5588
Joe Faubion	Tetra Tech	On-site TAPE Safety Officer	• Responsible for implementing health and safety plan and for determining appropriate site control measures and personal protection levels • Conducts safety briefings for Tetra Tech and site visitors • Can suspend operations that threaten health and safety • Disseminate project information to interested parties and Troy property owners and direct questions to TAPE project manager or DEQ	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 brett.veltri@ttemi.com (406) 442-5588
Ed Madej	Tetra Tech	Database and Geographic Information System Manager	• Responsible for developing, monitoring, and maintaining project database and property maps • Responds to requests from TAPE project manager and TAPE field team leader to provide copies of property maps to field teams on a daily basis • Works with CDM, Volpe, and EPA data and graphic managers to generate needed reports and maps from the Libby V2 database	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 ed.madej@ttemi.com (406) 442-5588

TABLE 2-1
(Continued)

KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
10 members	Tetra Tech	Field Team Member	• Responsible for conducting TAPE inspections and sampling as described in the work plan and for following SOPs. • Disseminate project information to interested parties and Troy property owners and direct questions to TAPE project manager or DEQ	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 (406) 442-5588
TBD	CDM Troy Sample Coordinator	Troy Sample Coordinator from CDM	• Accepts FSDSs and corresponding samples from Tetra Tech • Responsible for quality review of electronic data entered by Tetra Tech • Coordinates with the CDM laboratory coordinator regarding laboratory or archive storage assignments • Prepares chain-of-custody forms (COCs); ships or hand delivers samples as necessary • Coordinates with the Tetra Tech Field Data Coordinator regarding laboratory sample/data issues; assists in the revision of FSDSs, electronic data, and COCs as necessary • Exports electronic data to the Volpe data manager (for upload into the Libby V2 database) and resolves any export file issues • Provides general quality control input for consistency with Libby project sample and data collection requirements	Troy Field Office TBD
Courtney Zamora	Volpe Center, US DOT	Libby Site Manager/Field Representative	• Field Representative for Volpe Center • Review documents from Troy for consistency with Libby • Respond to resident's requests and concerns in Libby	EPA Information Center 501 Mineral Ave Libby MT 59923 (406) 293-6194 Courtney.zamora@volpe.dot.gov
Shawn Oliveria	CDM Libby	Libby Site H&S Manager	▪ H&S Manager for Libby Asbestos Project since 2002. ▪ Implement the Project Air Monitoring Program. ▪ Removal Oversight Technical Lead. ▪ Manage the Lincoln County Asbestos Landfill. ▪ Handle regulatory compliance for all dirty work operations and material handling procedures.	CDM Libby Office (406) 293-8595 (office) (406) 293-1547 (cell)

TABLE 2-1
(Continued)

KEY PERSONNEL

Mike Cirian	EPA	Remedial Project Manager/Environmental Engineer	• On-Site Remedial Project Manager for the Libby Asbestos Superfund Site • Manage construction activities • Resolve conflict and respond to residential inquiries in Libby	EPA Information Center 501 Mineral Ave Libby MT 59923 (406) 293-6194 Cirian.mike@epa.gov

Notes:

CDM	Camp Dresser & McKee	DEQ	Montana Dept. of Environmental Quality
EPA	U.S. Environmental Protection Agency	FSP	Field Sampling Plan
QAPP	Quality Assurance Project Plan	SOP	Standard Operating Procedure
TAPE	Troy Asbestos Property Evaluations	TBD	To be determined
Volpe	John A. Volpe National Transportation Systems Center	Tetra Tech	Tetra Tech EM Inc.
QA/QC	Quality Assurance/Quality Control		

Before work begins at a specific project site, Tetra Tech personnel are required to undergo site-specific training that thoroughly covers the following areas:

- Names of personnel and alternates responsible for health and safety at a project site
- Health and safety hazards present on site, including heat, physical stressors, insects and other potential biological hazards
- Selection of the appropriate personal protection levels
- Correct use of PPE
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment on site
- Medical surveillance requirements, including recognition of symptoms and signs that might indicate overexposure to hazardous substances, physical stressors (heat, cold), and other potential hazards
- Contents of the HASP

3.0 TROY DATA QUALITY OBJECTIVES

This section presents the DQOs for the TAPE inspection and sampling project. The DQOs are qualitative and quantitative statements developed through the seven-step DQO process (EPA 2000a, 2000b). The DQOs help to clarify the study objectives, define the most appropriate data to collect and the conditions under which to collect the data, and specify tolerable limits on decision errors that will be used as the basis for establishing the quantity and quality of data needed to support decision-making. The DQOs are used to develop a scientific and resource-effective design for data collection. The seven steps of the DQO process for this TAPE project are presented in Table 3-1.

Background information for the Troy OU study area was discussed in Section 1.0 as was a draft Site Conceptual Model (Figure 1-1). The Troy properties, where sources of LA contamination may be found, are not predictable; DEQ has therefore determined that each property in the Troy OU (including privately-owned and publicly-owned property) will be investigated and screened. The properties may or may not contain a building, or multiple buildings; specific use areas (gardens, former gardens, flower beds, gravel and dirt driveways, and play areas; all are areas with potentially greater exposure or greater use of vermiculite amendments); and yards and open space.

The DQOs will be used to design the TAPE project so that the sampling and analysis are appropriate to provide information to EPA regarding the properties with vermiculite-containing insulation (VCI) and other potential sources of LA contamination (vermiculite, building materials, or soil) within the Troy OU.

TABLE 3-1

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY OPERABLE UNIT

STEP 1: State the Problem
Section 1.0 of this Work Plan summarizes the history of the Libby Asbestos Superfund Site, identifies the key players and decision makers, illustrates the Site Conceptual Model, provides justification for the investigation and screening for the Troy OU, and identifies the schedule, budget, and necessary resources. **The following are problem statements associated with the Troy Properties investigation:** • Exposure to LA-contaminated vermiculite is a threat to human health (EPA 2000c). • Respirable LA asbestos is released when source materials are disturbed (EPA 2000c). • Potential source materials include VCI, LA-containing building materials, vermiculite waste products, and soils contaminated with LA. • Household dust and indoor air are potential exposure pathways. • LA-contaminated materials may be found randomly in and around Troy. • All properties within the Troy OU should be evaluated for sources of LA contamination.
STEP 2: Identify the Decisions
Principle Discussion Question: Do sources of LA contamination exist at properties within the Troy OU? **Property Identification Decisions:** • Identify the potential properties to investigate. • Identify the number of buildings on each property. • Identify the number of specific use areas, yards, and open space areas on each property in the Troy OU. **Sampling Decisions:** Inspect properties within the Troy OU to visually and analytically confirm the presence or absence of LA contamination in attics, other interior building spaces, and exterior areas, and the concentrations of LA if present. • Where will interior dust samples be collected? • Where will building material samples be collected? • Where will exterior soil samples be collected?

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY OPERABLE UNIT

STEP 3: Identify Inputs to the Decisions
For each property, inputs to the decision include: • Review of aerial photographs to define individual properties, compile addresses, and determine if the property could be individually bought or sold. • Visual inspections of property to determine location and number of buildings, specific use areas, living spaces, and attics. • Documented visible VCI in attics. • Documented visible VCI and other LA-containing building materials in interior building spaces (including but not limited to walls, crawl spaces, etc.). • Documented visible vermiculite in special use areas, yards, or open space areas. • Interviews with residents, owners, occupants, and employees • Analytical results from samples collected at each property.
STEP 4: Define Study Boundaries
• The Troy OU generally consists of the valley bottom from the north half of Section 25, Township 31 North, Range 34 West, and Section 30, Township 31 North, Range 33 West, east to the junction of Highways 56 and 2, and north to the northern edge of Section 21, Township 32 North, Range 34 West. Figure 1-2 shows the configuration of the study area for the Troy OU. • Some properties (approximately 25) within the Troy OU have previously been inspected and sampled under the Libby OU4 investigation. Data have been recorded in the Libby database for these properties and will be integrated with additional sampling data from the TAPE.

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 5: Develop Decision Rules
The Record of Decision for the Troy OU will identify the specific parameters, conditions, and concentrations of LA that determine if a source exists at an individual property and if that source requires cleanup. This Work Plan simply details how DEQ will collect sufficient and defensible information essential to support future cleanup decisions. That information includes conversations with property owners and other anecdotal information regarding historical use of vermiculite, VCI, and other LA containing materials, visual inspections, and sample results. Sampling decisions for the Troy OU are based on sampling protocols and limited sampling results from the work done in Libby. Cleanup decisions will be based on the presence of and the concentrations of LA contaminated materials • If VCI is visible in a building attic, then collect dust samples from the living spaces to evaluate the presence and concentrations of LA. • If VCI is not visible in an attic, then collect dust samples from the living spaces to evaluate the presence and concentrations of LA from any secondary indoor source of LA. • If vermiculite was used in building materials (plaster, concrete, or chinking), then collect building material samples to evaluate the presence and concentrations of LA from this potential secondary indoor source of LA. • If vermiculite is visible in a building interior, then collect discrete samples to evaluate the presence and concentrations of LA in the area. In addition, collect dust samples from the other building levels or areas to evaluate the presence and concentrations of LA in those living spaces. • If vermiculite is not visible in a building interior, then collect dust samples from the living spaces to evaluate the presence and concentrations of LA from any secondary indoor source of LA. • Collect discrete soil samples from specific use areas to evaluate the presence and concentrations of LA. • If the property contains a yard and large open space, then subdivide these areas by similar land uses (for example, grassed areas, driveways, parking areas, and front, back, and side yards) and collect a composite soil sample from each subarea to evaluate the presence and concentrations of LA. Figure 3-1 shows the steps used to inspect and sample buildings and exterior property in the Troy OU. Figure 3-2 provides some typical outdoor soil sampling designs for specific use areas, yards, and open spaces.

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 6: Specify Tolerable Limits on Decision Errors

- Sampling and measurement error are associated with environmental data collection and may lead to decision errors. Sampling error occurs when the sample is not representative of the true site conditions. Measurement error occurs because of random and systematic errors associated with sample collection, handling, preparation, analysis, data reduction, and data handling. Decision errors are controlled by adopting a scientific approach that uses hypothesis testing to minimize the potential for error.
- There are two types of decision error: false negative error, and false positive error. A false negative decision error occurs when the null hypothesis is rejected although it is true. The consequences of a false negative error would be that VCI or LA-contaminated dust or soil at a Troy property is not remediated. A false positive decision error occurs when the null hypothesis is not rejected although it is false. The consequences of a false positive error are that unnecessary resources are expended to undertake remedial action to address contaminated media that do not exist at concentrations that exceed action levels or acceptable risk levels.
- Property-specific sampling objectives and the random distribution of vermiculite and LA-contaminant soil limit the usefulness of statistical methods to eliminate sampling error. Therefore, sampling methods and procedures will be based on results from the Libby Asbestos Superfund Site. Tolerable limits on sampling decision errors cannot be precisely defined; however, the decision errors will be minimized by inspecting and screening all properties in the Troy operable unit. Decision errors based on analytical data will be minimized by the use of standard EPA-approved and Libby-specific analytical methods.

STEP 7: Optimize the Sampling Design

- All properties in the Troy OU will be uniquely defined in the work plan, and their locations will be identified using existing Lincoln County records, cadastral databases, and low-level aerial photographs. The number of Troy properties to be investigated will be approximately 1,000. Some houses and buildings likely are on multiple platted properties.
- Dust and soil samples will be collected using similar methods and standardized procedures that have been employed for the Libby Asbestos Superfund Site OU 4. With more than 4,000 Libby properties sampled since 2001, the methods have been defined (CDM 2002; CDM 2003a; CDM 2003b; EPA 2003a).
- Field QA/QC procedures will be implemented and will include equipment and personnel decontamination, QA samples, field documentation, and sample chain of custody. Scientifically valid and legally defensible data will be supported by collection of dust and soil field blanks and other QA samples at a frequency necessary to assess potential cross contamination from equipment and sample integrity during collection.
- Field sample data sheets, similar to those used in Libby, will be completed for each sample collected and each property inspected within the Troy OU. The field data sheet information will be recorded into the electronic Libby Asbestos Sample Tracking Information Center (eLASTIC) application for uploading to the existing Libby V2 database.

TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 7: Optimize the Sampling Design (Continued)
• Dust and soil samples collected at each Troy property will be uniquely labeled, and sampling information will be recorded into the eLastic application. The paper sample records, along with the samples, will be transferred under chain-of-custody procedures to a CDM sample data coordinator, who will verify completeness and accuracy of the records. • Montana DEQ and its contractor, Tetra Tech, will work closely with EPA, Volpe, and its contractor, CDM, to ensure that sample integrity is maintained throughout and that data quality is adequate to meet project objectives. • CDM will transfer the electronic sampling and field form information to EPA and Volpe and prepare the samples for analysis. • Figure 3-3 provides a schematic diagram of the TAPE process used by Tetra Tech to organize, conduct the property evaluations and sampling, and provide samples and electronic information to CDM, EPA, and Volpe.

Figure 3-1 TAPE Inputs

Figure 3-2 TAPE Outdoor Soil Sampling Design

Figure 3-3 TAPE Inspection and Sampling Process Diagram

4.0 FIELD PROCEDURES

This section of the TAPE Work Plan describes the field activities to be implemented for the TAPE inspection and sampling project and includes the following tasks:

- Mobilizing and demobilizing
- Obtaining access agreements
- Scheduling inspections with property owners
- Conducting verbal interviews
- Conducting property inspections – indoor, attic, outbuildings, outdoor open spaces, yards, specific use areas (using the inspection field form [IFF])
- Collecting indoor dust samples (recorded on dust sample field sampling data sheet [FSDS])
- Collecting outdoor soil samples (recorded on soil-like material sample FSDS)
- Collecting QA/QC samples
- Decontaminating equipment and personnel
- Containing and disposing of investigation-derived waste

SOPs, with current amendments, are provided in Appendix B and are referenced throughout this section of the TAPE Work Plan. As appropriate, Tetra Tech has developed project-specific guidance for Troy which is based largely on guidance developed specifically for the Libby Asbestos Superfund Site. The Tetra Tech project-specific guidance and the Libby-specific guidance documents that were used to generate the Troy guidance are listed below and copies are provided in Appendix B.

- Tetra Tech — TAPE FSDS and IFF Completion Guidance, Version 01
- Tetra Tech — TAPE Soil Sampling Guidance, Version 01
- CDM-Libby-03 — Libby guidance for completing the FSDSs
- CDM-Libby-04 — Completion of Information Field Form
- CDM-Libby-05 — Site Specific Standard Operating Procedure for Soil Sample Collection

Health and safety protocols and requirements will apply to all field activities and are summarized below. Information on quality control is provided in Sections 5.0 and 7.0 of this TAPE Work Plan.

4.1 HEALTH AND SAFETY PROCEDURES

The TAPE HASP (Appendix A) and Tetra Tech's corporate health and safety program plan will apply to all field activities undertaken as part of this project. All field staff conducting inspection and sampling activities will be required to:

1. Hold a current OSHA hazardous waste operations (HAZWOPER) 40-hour training certification and up-to-date 8-hour refreshers, as required under 29CFR1910.120;
2. Hold a current asbestos inspector training certificate;
3. Hold a State of Montana asbestos inspector license;
4. Have medical clearance to work wearing a half-face air purifying respirator; and
5. Be quantitatively fit-tested for the specific project respirator within the 12 months prior to the field activities.

The TAPE HASP in Appendix A provides detailed health and safety protocols and requirements, including directions for when to use PPE, such as respirators. All attic entries will be conducted in modified level C PPE that will include a half-face or full-face air purifying respirator with HEPA cartridges. Other property inspection activities, including dust sampling and soil sampling, will be conducted in modified level D PPE. Mr. Joe Faubion will be the Tetra Tech Site Safety Officer for the field activities (see Table 2-1 of this TAPE Work Plan). Negative exposure assessments for the field teams will be performed as necessary, as described in the HASP and at the direction of the Site Safety Officer.

4.2 SITE ACCESS AND LOGISTICS

Section 4.2 provides information about community relations, logistics and schedules, and site access agreements.

4.2.1 Community Relations and Information Centers

Tetra Tech will coordinate with DEQ to ensure that sufficient public outreach (including public meetings, fact sheets, newspaper articles and notices, and radio announcements) is completed before and during implementation of the TAPE. Tetra Tech will provide personnel to attend public meetings in Troy and will help prepare presentation materials, at DEQ's request. Public outreach and information on the

purpose and nature of the TAPE and its role in the overall investigations and cleanup at Troy and Libby are essential to its success.

Tetra Tech and DEQ will set up and staff a field office in Troy at least 1 month before and for the duration of TAPE field activities. The Tetra Tech field office will be the TAPE logistical center for obtaining property access agreements, scheduling field activities, returning samples and field forms at the end of the day, and transferring sample custody from Tetra Tech to CDM. The Tetra Tech field office will also provide a physical location and venue for people in Troy to provide and obtain information about the project. The Tetra Tech field office will also have telephones and answering machines for contacting project personnel when the office is not staffed and after regular hours (Monday through Friday 8:00 am to 5:00 pm). The address and phone number for the Tetra Tech field office will be advertised and posted at the location.

The existing EPA Information Center at 501 Mineral Ave in Libby will also be an information resource for Troy residents, providing access to major project documents. Troy area residents may phone the information center toll free at 1-888-420-6810 or visit the center Monday through Friday from 8:30 a.m. to 5:00 p.m.

DEQ has established a repository for general and Troy-specific information at the City Hall in Troy, located at 301 E. Kootenai. The Troy City Hall is open Monday through Friday from 8:00 a.m. to 5:00 p.m. Tetra Tech and DEQ will continue to provide updated information in City Hall throughout the field sampling activities.

Information about the Libby Asbestos Superfund Site is also available on the Internet at <http://www.epa.gov/region8/superfund/libby.html>. DEQ will maintain updated information regarding Troy on this webpage.

Section 2.0 of this Work Plan discusses the roles and responsibilities of the DEQ and Tetra Tech in community relations.

4.2.2 Logistics and Schedule

Tetra Tech will establish a field office in Troy for the duration of TAPE field activities. Tetra Tech will identify and provide all necessary personnel, sampling equipment, PPE, and project materials for

implementing this Work Plan. All Tetra Tech field personnel will be trained not only in specific tasks but also on the overall objectives of the TAPE. This training will facilitate TAPE implementation and allow for effective communication with the public and other team members.

Tetra Tech personnel will include the TAPE project manager, who will oversee all project activities and logistics and will ensure that the lines of communication are maintained to resolve any issues or concerns that may arise during the field efforts. The Tetra Tech project manager will reside in Helena but will be at the project site in Troy for about 50 percent of the field activities. The TAPE field team leader will be based out of Troy and will be responsible for obtaining site access agreements, assisting with public outreach, scheduling daily field activities, and providing quality control and oversight of the five TAPE field teams. Tetra Tech will also provide a field data coordinator to reside in Troy and assist the project manager and field team leader with daily project tasks. The Tetra Tech Field Data Coordinator will have primary responsibility for checking and cataloging soil and dust samples at the end of each day and for working closely with the CDM Troy Sample Coordinator to ensure that complete, adequate, and secure sample information is collected and transferred to EPA. The detailed responsibilities for these Tetra Tech project personnel are further discussed in Section 5.5.

Tetra Tech will provide five two-person TAPE field teams stationed in Troy for the duration of the field effort. Some substitution and rotation of field staff on and off the TAPE project is expected, but the field staff will work a minimum of 2 weeks before substitutions occur. The Tetra Tech field team leader (Mr. Stockwell) will continuously accompany the field teams to ensure and verify that the teams are conducting the TAPE activities as described and outlined in this Work Plan. The Tetra Tech field teams may conduct limited TAPE inspections on weekends (both Saturday and Sunday) to better accommodate the schedules of Troy property owners. Both members of a field team will be HAZWOPER certified, hold current asbestos inspector licenses, and be trained to properly handle the health and safety protocols for this project.

On average, a Tetra Tech field team will complete three TAPE inspections per day, depending on the complexity of the properties inspected. With five field teams, Tetra Tech can complete an average of 15 total TAPE inspections per full day. If the field inspections continue uninterrupted, Tetra Tech could complete the inspections of more than 1,000 Troy properties in about 75 full work days, or within a 15 week time frame. Tetra Tech's projected schedule for completing the TAPE inspections will be finalized when DEQ receives adequate EPA funding.

4.2.2.1 Communications

Field team members will be provided with cell phones (which will necessitate use of a temporary cell tower), satellite phones, or multi-way radios for the duration of field activities. Contact information, including emergency numbers, for all field teams and for TAPE project management personnel in Helena, Montana, will be stored in the Tetra Tech Troy field office. In addition, the Montana DEQ TAPE Project Officer (Ms. Catherine LeCours), CDM Troy Sample Coordinator, and EPA Libby Asbestos Superfund Site personnel will be provided with contact information for ready access to the Tetra Tech field teams.

4.2.2.2 Equipment

Appendix C details equipment and supplies Tetra Tech identified as necessary for the TAPE field activities described in this Work Plan. Equipment and supplies that are not immediately available to Tetra Tech will be purchased or rented before TAPE field activities begin. Before purchased or rental equipment or supplies will be accepted, the Tetra Tech field team manager will inspect the goods to ensure they are in good condition and free of defects.

4.2.2.3 Pre-Field Activities

Before field crews mobilize to Troy for the TAPE field inspections, Tetra Tech will prepare detailed property maps that identify individual Troy properties. Property boundary and other details will be gathered from public databases (cadastral) and projected onto a high-quality, high-resolution air photograph. Individual Troy property maps will be used during the TAPE field inspections to record approximate locations of the specific use areas and yard samples collected at each property. These property maps will be field checked and may be revised as necessary during the inspections. Tentative inspection and sampling schedules may be based on a block-by-block TAPE inspection pattern. The TAPE inspection schedule will be refined as Tetra Tech schedules the inspections at times and dates convenient to the property owners.

4.2.2.4 Field Team Organization

Five field teams of two people per team will conduct the TAPE inspections and sampling. On average, 15 properties will be inspected and sampled per day. At the start of each day, the field teams will meet at the

Tetra Tech field office for daily safety and organizational briefings (see Section 4.1 and Appendix A HASP).

Before the morning briefing, the Tetra Tech field team leader will have prepared a packet for each property to be inspected and sampled that day. Each packet will include:

- A copy of the signed access agreement or blank access agreement if occupant provided prior verbal agreement,
- Details of the scheduled inspection date and time, and the name and telephone number of the property owner or the person who will be present for inspection and sampling, if different than the property owner,
- A property-specific verbal interview form,
- A property-specific IFF,
- A property-specific FSDS,
- Preprinted property-specific property, building, sample point, and sample identification labels, and
- Two copies of the property parcel maps.

Each field team will have a numbered logbook specific for the Troy project and will be responsible for any additional information included in the logbook. Additional TAPE inspection and sampling supplies (as described in Appendix C, list of supplies) will be kept at the Tetra Tech field office for use by the field teams. The daily briefings will be used to coordinate daily property inspections, calibrate sampling equipment, and collect supplies. The daily briefing will include a review of any issues or problems that arose the previous day, and will provide an opportunity for field team members to ask questions and share lessons learned. At the end of each day, field teams will return to the field office to deliver samples and paperwork to the Tetra Tech Field Data Coordinator, download digital cameras, charge rechargeable equipment, and store field equipment for the evening. Section 6.0 of this Work Plan contains additional logistical details on TAPE data management.

4.2.3 Access Agreements

Approximately 1 month before TAPE field activities begin, Tetra Tech will assist DEQ with mailing access agreements to every Troy property owner where the property has been identified for inspection and sampling. A cover letter will contain information from DEQ on the proposed sampling and contact information for Tetra Tech Troy field office, DEQ, EPA, and the Libby Information Center. The packet

will also contain two copies of an access agreement form and a postage-paid envelope for the property owners to return a completed access agreement. The other copy of the access agreement is for the property owner's records. The cover letter will explain the need for the signed access agreement and encourage any property owners who have questions or concerns about the process to contact the designated parties. An example cover letter and access agreement is provided in Appendix D.

The Tetra Tech project manager and field team leader will manage information mailed in from the Troy property owners, including signed access agreements. Approximately one month after DEQ and Tetra Tech mail the access agreements, a field team of two Tetra Tech personnel will follow up with properties where no response has been received. Follow up contacts (in person or by telephone) will explain the purpose of the TAPE, describe the inspection and sampling process, and answer any pertinent questions. Property owners may provide verbal approval and schedule an inspection; therefore, field teams may obtain a signed access agreement immediately prior to a scheduled inspection.

If property owners are not available during the reconnaissance, the field team will revisit each location at least three times, and the field team leader (or designee) will continue to follow up with personal visits and by telephone. After repeated attempts to contact the property owner by the field teams and the field team leader, Tetra Tech will repeat the mailing with a letter describing the attempts made to contact the property owner.

When the field team leader has received either verbal approval or a completed and signed access agreement either by mail or from a field team, Tetra Tech will contact the property owner by telephone to schedule a TAPE inspection and sampling visit.

Tetra Tech will make reasonable efforts to find a TAPE inspection and sampling date and time that are convenient for the property owner. TAPE inspections and sampling schedules will include evenings (daylight hours only) and weekends, as needed based on the requests of property owners. If property owners respond to the access agreement favorably, but a property is currently uninhabited (for example, it is only seasonally occupied or is currently for sale, or no buildings are present on the property), Tetra Tech will attempt to inspect and sample the property with a designee of the property owner. Properties will not be exempted from inspection or sampling on the basis that they are currently uninhabited, however.

Tetra Tech will not advise property owners of the likely nature of removals at their properties or estimated removal dates during the TAPE scheduling phase, the personal interviews, or the TAPE inspections and sampling. Property owners will be advised that DEQ and EPA will determine removals and schedules after analytical results have been received and evaluated.

Some Troy property owners may be non-responsive or unwilling to sign an access agreement, even when Tetra Tech has attempted to contact them by all reasonable means (telephone, visit to the property, and repeated mailings) to obtain permission for a TAPE inspection and sampling. Tetra Tech will provide DEQ with a list of all Troy properties where the property owner could not be contacted or refused to sign an access agreement at the conclusion of TAPE field activities.

4.3 VERBAL INTERVIEW

The Troy property visit by the TAPE field team will commence with a verbal interview by the field team with the property owner to acquire background information about the property. The field team will interview the property owner using the questions provided on the interview form (Appendix E). Interview topics will include the known or suspected use of VCI or other LA-containing building materials in the house or outbuildings and possible introduction of other sources of LA within or near the property (including garden and landscaped areas and neighboring properties). A unique property identification number (AD-XXXXXX) will be assigned to each individual property that is inspected.

All buildings encountered during the TAPE inspections will be classified as a primary structure (habitable building, for example, a house, apartment, or main commercial space); or a secondary structure (non-habitable building, such as garages, shops, sheds, barns, or dog houses). The verbal interview will address all primary and secondary buildings and special use, open space, and yard areas located on a Troy property.

4.4 BUILDING INSPECTION, SAMPLE COLLECTION, AND RECORDING PROCEDURES

This section describes the inspection, sampling, and recording to be completed for each TAPE inspection.

4.4.1 Indoor Inspection

The two-person field team will visually inspect each building for the presence of LA contamination. One team member will access and inspect the attic (if safe, present, and reasonably accessible) and will inspect additional areas where VCI may be exposed in living spaces (crawlspaces, closets, and any wall openings). If VCI is observed, the field team member will estimate the quantity based on field measurements or visual estimation, with field measurements (length, width, and height of item) collected wherever possible.

The second team member will document results, including estimated quantities of VCI and other insulation (if present), on the IFF and will record additional pertinent information in the field logbook. As much as is possible in a non-destructive manner, the visual inspection will include checking under other types of insulation (such as blown-in or fiberglass insulation) for VCI. Visual inspections will not involve opening up walls or ductwork to inspect for VCI within the building wall cavities, but will include removal of a representative sample of electrical switch plates to inspect wall interiors. Furthermore, it will include inspecting ductwork in accessible, unfinished areas of the building for VCI. In particular, the field team will note whether utility conduits (including heat/cooling vents) run from the attic to the living space. Visual inspections will not include inspecting the roof.

Attics will be considered reasonably accessible if they can be reached by stairs, hanging stairs, or a non-conductive stepladder (either from the interior or exterior of the building). Attics will be inspected in a manner that, in the judgment of the field team, is not likely to release additional VCI into the living space (exterior access is preferable). The field team will compare exterior roof lines and interior ceiling heights with attic interiors in an effort to identify isolated attic areas that may exist between the roof and the main attic, or between the attic and the interior ceilings. If isolated attics are found, they will be inspected if possible, and barriers between attic areas and access points will be described in the IFF. Attic inspections will also involve inspection of kneewalls (areas where the pitch of the roofline meets the walls). Kneewalls may be used for storage or to improve the finished look of an attic. Kneewalls will be accessed wherever possible, as these areas may provide additional information on construction material. (For example, kneewalls may have unfinished floors compared with the finished floors in the rest of the attic.) If trusses or bracing posts are present in the attic that may pose an obstacle to potential cleanup, these items will be briefly described in the inspection form.

As detailed in the HASP, decontamination zones will be established during the TAPE project, such as at the base of ladders used to access attic spaces or outside of crawl space entrances. These areas will be covered with two layers of polyethylene sheeting during sampling in the attic or crawl space. After personal and equipment decontamination are complete and polyethylene sheeting removed, decontamination areas will be cleaned of debris and residue using appropriate HEPA vacuuming or wet cleaning procedures. Visitors, including building occupants, will not be permitted to enter the decontamination zone without proper qualifications and authorization.

If potted plants are located inside the primary building, the field teams will note whether vermiculite-containing potting soil is present, as this type of soil could affect results of dust sampling.

As described in the HASP (Appendix A), the field team will not be required to access any attics, crawl spaces, or living areas if there is an unacceptable safety hazard, including biological hazards. The field team will not inspect Troy properties for non-VCI and non-LA asbestos. However, damaged or friable suspect asbestos-containing materials that are observed in the inspection will be noted in the field notebook. This information may be of use in interpreting sampling results and planning potential remediation efforts.

The field team may choose to photo-document specific conditions in the building during the TAPE inspection for future reference. The property owner will be asked for permission before any photographs are taken.

TAPE inspections will be documented on IFFs (Appendix E) and in the field logbooks. Pertinent details will include, but are not limited to, identifying the primary and secondary buildings, defining attic spaces, and sketching on the detailed property maps.

As described in Section 4.3, buildings on a property will be classified as primary or secondary. Every primary and secondary building will be subject to a TAPE inspection, an IFF will be completed, and samples collected.

4.4.1.1 Record Building Locations with GPS

As part of the TAPE inspection, the location of each primary and secondary building on the property will be recorded using the backpack-mounted Trimble XRS-Pro global positioning system (GPS). The GPS

location will be recorded at the primary entrance to each building. Coordinates will be saved on the GPS with a unique identification number that starts with the notation "BD-XXXXXX," where "BD" indicates a building location, and will also be recorded by the field team on the IFF and in the field logbook.

4.4.2 Indoor Dust Sampling

Dust samples will be collected using microvacuum (microvac) sampling techniques in all primary buildings, regardless of whether VCI or other LA-containing building materials are observed. Asbestos is not visible to the unaided eye and not all sources (historical or current) may be identified during visual inspection, therefore, dust samples are collected at all properties. Dust samples will be collected following the procedures provided in American Society for Testing and Materials (ASTM) *Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations* (D 5755-95), as amended for the Libby Asbestos Superfund Site. A copy of this standard ASTM method is provided in Appendix B, with site-specific applications described below (ASTM 1995).

The decision to use microvac sampling, rather than wipe sampling, for the TAPE inspection and sampling was based primarily on the need to collect data that are consistent with data collected for the Libby Asbestos Superfund Site. EPA, and its contractor CDM, have used microvac sampling methods to collect the indoor dust samples in Libby. Microvac sampling methods are assumed to collect samples that more accurately measure releasable asbestos fibers when compared with wipe samples. Each indoor dust sample will be composed of a three-point composite sample, as described in the above-mentioned ASTM standard (ASTM 1995), as amended.

4.4.2.1 Select Sampling Locations

The TAPE field team will select sample locations based on the team's visual inspection of the buildings and estimation of where contaminated dust is most likely to be found. The number and locations of dust samples will be selected as described below.

Primary and Secondary Buildings

Dust samples will be collected in every primary and secondary building regardless of whether LA contamination was observed during the visual inspection.

- Two dust samples will be collected on each level of the building's living space (including finished basements):
  - One three-point composite sample will be collected from accessible horizontal surfaces (for example, windowsill, shelving, and cabinets). The TAPE field team will select the surface or surfaces based on factors including proximity to observed VCI and dust accumulation. (Preference will be given to surfaces with higher dust accumulation that are closer to observed VCI.)
  - One three-point composite sample will be collected from high-traffic walkways, which will be selected by the TAPE field team based on the most probably walkway for tracking contamination into the building, including walkways adjacent to entry doors on the main floor. It will include main walkways and corridors between living areas on upper floors and in basements without walk-out access. Walkways may be solid surfaces or covered with rugs and carpets, or a combination. Samples will not be collected from temporary floor coverings that may be routinely cleaned or discarded.
- One three-point composite sample will be collected from each unfinished basement, if present. This sample will be collected from both walkways and horizontal surfaces inside the basement, with specific aliquots selected at the discretion of the TAPE field team.
- One three-point composite sample will be collected from each attached garage or shop, if present. This sample will be collected from both high-traffic walkways and horizontal surfaces inside the attached building, with specific aliquots selected at the discretion of the TAPE field team.
- No dust samples will be collected in attics or crawlspaces with visible LA contamination. Based on extensive sampling and analytical results from the Libby Asbestos Superfund Site, VCI found in attics and crawlspaces is assumed to be contaminated with LA fibers (EPA 2003b).
- The field team may choose to collect additional, targeted dust samples if migrating VCI is observed in the living space of a primary structure. These data would be used to design small scale vermiculite removal actions if necessary.

4.4.2.2 Dust Sample Collection

Collecting a microvac dust sample involves vacuuming dust from a surface and drawing the sample through a filter designed to capture particulates larger than 0.45 micrometers (µm). The ASTM method D5755-95, as amended for the Libby Asbestos Superfund Site, provides the procedural details for properly collecting a microvac dust sample (Appendix B, ASTM 1995).

The microvac device will consist of a battery-operated low-volume sampling pump connected to a 25-millimeter (mm) vacuum dust sampler cassette. The analytical laboratory will provide the cassettes and tubing. The cassettes will contain a 0.45-µm mixed cellulose ester filter. A 6.35-mm diameter plastic

tubing will be used to connect the cassette to the pump. A 25- to 37.5-mm length of 6.35-mm diameter tubing will be used to create a "nozzle" on the cassette for sampling. The nozzle tubing will be cut at the sampling end at an approximate 45-degree angle.

The pump will be calibrated each morning in the Tetra Tech field office using a standard calibration device such as a Dry-Cal. The pump will be calibrated using a 25-mm vacuum dust sampler cassette to simulate field operation. The flow rate used for sampling will be approximately 2 liters per minute, which provides an approximate air velocity of 100 centimeters per second through the 6.35-mm diameter tubing. The field teams will be equipped with one back-up pump to ensure proper operation and may return to the field office for recalibration as necessary.

The sampling area for each dust sample point (aliquot) will be 100 square centimeters (cm^2) delineated using a fixed template provided with the sampling cassettes. The aliquot sample will be collected by activating the pump and passing the angled nozzle across the delineated surface for 2 minutes.

Each indoor dust sample will contain three sample aliquots; that is, three separate 100 cm^2 surfaces will be vacuumed using one cassette. The cassette will therefore contain dust from a total 300 cm^2 surface area. To collect aliquots, the pump will be turned off and the sampling device moved to the next sample point. Once the next aliquot area has been delineated using a template, the pump will be turned on and the next 100 cm^2 surface area will be vacuumed. When all three sample aliquots have been collected, the sampling device will be turned upside down so that any loose dust falls into the cassette. The exterior of the cassette and nozzle will be wiped clean with a wet towel (wet wipe). The cassette will be detached from the pump, the cap returned to the cassette, and the cassette and the nozzle will be placed in a re-closable plastic bag for shipment to the laboratory (see Appendix B for detail). The nozzle will be included in the shipment because significant quantities of dust can remain in the nozzle. The sample will be labeled using the pre-printed sample labels and will be wrapped for return to the Tetra Tech field office. Dust samples will be labeled with a unique sample identification number "TT-XXXXX" where "TT" indicates a "Troy TAPE" sample. Chain-of-custody procedures will be followed as described in Section 5.5.2.

Indoor dust sample point locations will be described and recorded in the TAPE field logbook and on the FSDS and may be photographed and sketched on the property map at the discretion of the field team.

4.4.3 Building Materials Sample Collection

The TAPE field sampling may encounter some building materials (for example, chinking between log in log homes, special concrete with vermiculite added, and lathe and plaster walls) include vermiculite within the building materials. These special building materials, when encountered, will be sampled and information recorded in the logbook and on a soil-like materials FSDS. The building material samples will be labeled with a unique sample identification number "TT-XXXXX", where "TT" indicates a "Troy TAPE" sample.

4.4.4 Outdoor Inspection

All areas of the Troy properties that are not covered with buildings will be inspected for vermiculite product in soil and surface materials. The areas of the Troy properties that are not covered by buildings will be grouped into two general types: (1) outdoor yards and open space, and (2) specific use areas. Figure 3-2 provides typical outdoor soil sampling designs for these two general types of outdoor areas.

Special attention will be paid to areas where known sources of LA may have been introduced (including fill areas) and to "high traffic areas" where potential LA is likely to be tracked indoors. The TAPE field team may further subdivide the outdoor yards and open space by land use types, such as yards or grassy areas; driveways; parking areas, and filled areas, if known or visible. Sketches will be drawn on the individual property maps to show the separate land use areas. The property sketch will also show fences, large trees, or other potential obstructions to potential future remediation. Properties that do not have yards, such as commercial properties, will be described as such on the IFF and in the field logbooks; outdoor areas such as paved parking or driveways will still be inspected. As best identified by the property owner, property boundary lines will also be noted on the IFF.

One member of the TAPE field team will visually inspect each area for the presence of vermiculite product or LA-containing rock while the second team member documents the locations and estimated quantities of observed vermiculite product on the IFF and in the field logbook. Locations of vermiculite product observed will also be sketched on the property map. Visual outdoor property inspections will not include digging below the soil surface or destructive techniques to investigate underneath asphalt or concrete. It will not be necessary to delineate the vertical extent of contamination because the default excavation depth for remediation of specific use areas is 18 inches below ground surface (EPA 2003b).

Similarly, the default excavation depth for remediation of general yard areas, open space, and driveways is 12 inches below ground surface (EPA 2003b).

Specific use areas include current and former flower beds, current or former gardens, planters, compost piles, play areas, gravel or dirt driveways, and stockpiles. These areas will be included in the inspection. Visual inspections of specific use areas will include limited digging below the soil surface with the least disturbance possible.

The field team may elect to photo-document specific conditions on the property for future reference. The property owner will be asked for permission before photographs are taken.

4.4.5 Outdoor Soil Sampling

After the visual inspection of the property has been conducted, the TAPE field team will collect soil samples from special use and yard areas following the procedures described below and in the Tetra Tech's project-specific guidance (Appendix B). Soil will be sampled regardless of the results of the visual inspection. Soil sampling will include the following steps:

- Identify sampling locations
- Collect samples
- Record locations on Troy property map
- Record sample locations using GPS

4.4.5.1 Identify Sampling Locations

TAPE soil samples will be collected as five-point composites with composite subsamples taken from similar use areas. Typical designs for outdoor soil sampling are shown graphically on Figure 3-2. It can be assumed that LA sources would have been distributed across an area, for example by tilling into a yard or garden. A minimum of one five-point composite soil sample will be collected at each Troy property, unless the property has no soil-covered areas (for example, all outdoor areas are paved). A five-point composite will also be collected from the specific use areas; however, the size and dimensions of the specific use area may require that less than five subsamples be collected for some specific use areas. At least one five-point composite sample will be collected from the yard area. In general, five-point composite samples will not cover more than approximately 5,000 square feet. A maximum of five, five-point composite samples will be collected at each property, but additional composite or grab samples may be collected at the discretion of the TAPE field team. The Tetra Tech TAPE field team will use

professional judgment to select the appropriate numbers of soil samples to collect at each property. In addition, the TAPE field team will collect all soil samples with the minimum amount of disturbance to the surface. Sod will be carefully removed and immediately replaced after sampling and care will be taken to collect soil samples without disturbing growing flowers and vegetables. To ensure consistency, all TAPE field teams will be provided the same training and guidelines, and training will include "brainstorming" potential property scenarios and discussing proposed sampling approaches.

4.4.5.2 Collect Soil Samples

Soil samples will be collected from (1) outdoor yards and open spaces, and (2) specific use areas at properties in the Troy OU. Figure 3-2 provides typical outdoor soil sampling designs for these two types of outdoor areas.

A typical Troy yard sample will be composed of a five-point composite soil sample collected from the 0 to 1 inch depth. As shown in Figure 3-2, the five individual sample points that will make up each composite sample will be located within a similar land use area, such as the back yard, front yard, or side yard. A minimum of one five-point composite sample will be collected from each Troy OU property with a yard. Additional five-point composite samples will be collected when the yards are larger than 5,000 square feet.

A typical open space sample will also be composed of a five-point composite soil sample, as shown on Figure 3-2, collected from the 0 to 1 inch depth. Typical spacing for the individual five-point locations are shown as approximately 30 feet, but this distance can be modified to best fit the land use area. Additional five-point composite samples will be collected for each open space area of approximately 5,000 square feet. The Tetra Tech field team will use professional judgment to select the appropriate number and type of soil samples to collect for each yard and open space. Not all open spaces may be sampled, depending on current and historical uses. To ensure consistency, all field teams will be provided the same training and guidelines, and training will include "brainstorming" potential property scenarios and discussing proposed sampling approaches.

Specific use areas in Troy include outdoor gardens, former gardens, flower-beds, play areas, gravel or dirt driveways, and other areas with potentially greater exposure or greater use of vermiculite amendments. Five-point composite soil samples will be collected from the 0 to 6 inch depth interval in specific use areas. Figure 3-2 presents typical layouts for a garden plot, flower bed, and undefined areas. Typical

sample spacing shown on Figure 3-2 is for 10 feet separation, but the distance can be modified to best fit the specific use area. The TAPE field teams will be provided training and guidelines for consistent sampling of specific use areas.

Disposable hand trowels will be used to collect approximately 500 grams of soil sample from the 0 to 1 inch or 0 to 6 inch soil interval at each subsample location for a total of approximately 2.5 kg of soil. If a small metal shovel is required to assist with sampling to 6 inches, the shovel will be thoroughly cleaned and decontaminated after each sample using procedures outlined in Section 5.1. Subsamples will be placed into one re-closable plastic bag and mixed. During sample collection and mixing, the field team will attempt to shield the soil samples from the wind to avoid potentially losing lighter fractions of the soil to the ambient air.

The initial re-closable plastic bag will be placed inside a second bag as a precaution. A pre-printed sample label will be affixed to the outside of the inner re-closable bag as well as the sample ID number written on the outside of the inner bag. The outer re-closable plastic bag will also be labeled and marked similarly using the pre-printed sample ID numbers. Soil samples will be labeled with a unique sample identification number "TT-XXXXX" where "TT" indicates a "Troy TAPE" sample. Chain-of-custody procedures will be followed as described in Section 5.5.2.

The TAPE field team will attempt to restore the land surface to its prior condition after sampling, but Tetra Tech will not be responsible for re-laying sod or replanting. For most sample locations, the small area can be replaced with soil from immediately surrounding the excavation and lightly tamped down. In addition, each TAPE field team will have some commercially-available potting soil or quality topsoil available to repair any small excavations that cannot be easily filled with nearby soil materials. It is not envisioned that sampling will require large-scale disturbance of yards, since the sample size required is small.

4.4.5.3 Record Sample Location on Troy Property Map and with GPS

The field team will mark each soil subsample location on the Troy property map with labeling to indicate the composite sample for which the subsample was collected. A backpack-mounted Trimble XRS-Pro GPS will be used to record the midpoint subsample location for each composite soil sample. The GPS location coordinates will be recorded on the GPS unit with a unique identification number that

corresponds with the sample point identification number "SP-XXXXXX." The GPS coordinates will also be recorded in the FSDS and field logbook for backup and verification of sample locations.

4.4.6 Photography

Each TAPE field team will have a camera for photo-documenting the conditions at a property, if the conditions are not readily described in writing or if, in the judgment of the field team, photographs may assist in development of a remedial action plan for that property. Permission from the property owner will be obtained before any photograph is taken, other than for photographs taken from the public right-of-way.

All photographs will be recorded in the field logbook and on the IFF, and on the property map using the following symbol to indicate the position where the photograph was taken and the direction it was taken (•→). No accurate distance scales will be used for landscape photographs, but general distances can be estimated by noting the location where the photograph was taken. All photographs will be taken using digital cameras and will be download the same day at the Troy Tetra Tech field office and saved.

5.0 FIELD QUALITY CONTROL PROCEDURES

Section 5.0 describes the methods and procedures for decontamination, quality assurance samples, field documentation, handling investigation-derived wastes, and maintaining chain of custody of samples and records.

5.1 EQUIPMENT AND PERSONNEL DECONTAMINATION

Dust samples will be collected using laboratory-provided filter cassettes with a new cassette and template for each sample collected. The air pump will not require decontamination between samples as a matter of course because of its position behind the sample filter during sample collection. If the exterior of the air pump becomes visibly dusty, it will be wiped clean with a damp paper towel to avoid transferring dust from one location to another.

Disposable scoops and individual sample collection bags will be used for soil and building material sampling; therefore decontamination of the equipment that is in touch with the soil is not necessary. If a small metal shovel is required to assist with sampling to 6 inches in hard, compacted soils, the shovel will be thoroughly cleaned and decontaminated after each sample using a spray bottle with distilled water and paper towels.

Visible soil on hands or clothing will be removed by washing with soap and water. Additional personnel decontamination procedures, including requirements for decontamination zones, are described in Section 9.2 of the HASP (Appendix A). PPE will include disposable gloves, disposable protective outerwear, work boots, and respirators. The respirators will be cleaned and decontaminated as discussed in the HASP (Appendix A).

5.2 QUALITY ASSURANCE SAMPLES

Field blank dust samples will be collected at a frequency of one blank sample per 20 samples, or at 5 percent. Field blank dust samples will be collected at locations selected by the TAPE field team, and will be collected by attaching a cassette to the pump and pumping for 1 minute at the same rate as for dust sample collection. However, the cassette will not have a nozzle, and the end of the cassette will be exposed to indoor air at the selected sampling location, rather than passed over a surface of any kind. Data for the field blank dust samples will be evaluated to assess whether a potential exists for airborne

asbestos to cause analytical detections of asbestos in dust, or for cross-contamination to occur during sampling.

Dust lot blank samples will also be submitted to the laboratory for each lot or batch of cassettes received from the laboratory. Data for dust lot blank samples will be used to evaluate whether cartridges were received asbestos-free from the laboratory. Tetra Tech will not use a cassette from a given lot until the dust lot blank results confirm the cartridges are asbestos-free.

Soil field equipment blanks will be collected at a rate of one per calendar week (Monday through Sunday) of sampling per field team. Field equipment blanks will be collected by placing silica sand (that is `asbestos-free as analyzed by polarized light microscopy [PLM]) in a re-closable plastic bag, mixing it with a disposable trowel, and submitted for analysis following the same PLM methods. Data from field equipment blank samples will be used to evaluate whether the disposable equipment is asbestos-free.

Field equipment blanks are sent to the EMSL Laboratory located in Libby for analysis by method PLM-9002. In addition, during the initial portion of the field work, at least two dust samples per team will be sent to the EMSL Laboratory for rapid analysis. These samples will confirm the field team members are using proper dust sampling techniques.

Soil field duplicate samples will be collected at a frequency of one sample per 20 composite soil samples or a rate of 5 percent. Field duplicate samples will be collected as samples collocated in the same land use area (yard or landscaped area, for example) and will contain the same number of subsamples (typically five), but will be collected from different subsample locations. Data for soil field duplicates will be used to evaluate the potential variability in LA concentrations in a specific land use area. These data will not be used to evaluate precision in sampling or analytical techniques.

All quality assurance samples will be submitted “blind” (labeled as a collected sample) to the laboratory.

5.3 FIELD DOCUMENTATION

Example field forms (interview forms, IFFs, and FSDS) are provided in Appendix E. Before the TAPE field activities begin, all members of the Tetra Tech field team will receive the same training on implementation of this Work Plan in general and on use of these forms in particular. Property owner interviews, property inspections, and sample collections will be conducted using these forms to ensure

consistency between properties and between TAPE field teams. Use of these forms will also allow compilation of TAPE-derived data into the Libby V2 database (see Section 5.5).

Any additional information that is not recorded on field forms will be recorded in the TAPE field logbooks. Each field team will maintain a field logbook for recording the date and time of each property inspection, the names of the people who allowed property access and completed the interview, the property ID and building ID numbers, the number and type of samples collected at the property including sample ID numbers and FSDS numbers, and any other pertinent information. A new page will be started in the field logbook for each property. The field logbook will serve as an independent (backup) record for all activities conducted and samples collected at a property, in the event that IFFs or FSDSs are lost or damaged. The field logbook will also be used to record additional observations of the field team that relate to potential remedial action at a property, such as locations, quantities and types of suspect asbestos-containing material that is not VCI or LA, and access limitations that were not noted on the IFF.

Information will also be recorded on the individual property maps by sketching directly onto the property maps, which will have an aerial photograph base. Property map sketches will show the locations of any observed VCI and LA-containing rock, primary and secondary buildings and the main entrance of each building, and the outdoor sample (including subsample) locations.

5.4 CONTAINMENT AND DISPOSAL OF INVESTIGATION-DERIVED WASTE

Investigation-derived waste will include used wet wipes, wet paper towels, disposable gloves, used respirator cartridges, used plastic tubing, decontamination water, disposable protective outerwear, plastic floor coverings, and other minimal waste. It is possible, but not likely, that these investigation-derived waste materials may contain some asbestos. Therefore, all investigation-derived waste will be double-bagged in appropriate asbestos bags, labeled with asbestos labels, and stored in approved containment at the Tetra Tech field office until it can be properly disposed of at an approved landfill (Lincoln County outside of Libby). Non-sampling waste generated by the TAPE field teams, such as food containers and waste paper, will be separately bagged and disposed of as solid waste at a solid waste landfill.

5.5 RECORD KEEPING AND CHAIN OF CUSTODY

At the end of each day, or more often if required, the TAPE field teams will return to the Troy Tetra Tech field office to transfer the dust, building material, soil, and QC samples; the IFFs, interview forms, and

FSDSs; and copies of the appropriate logbook pages to the Tetra Tech sample coordinator (or the coordinator's designee). All verbal interview forms, IFFs, and FSDSs will be compiled at the Troy field office, photocopied, and the original copies forwarded to the Tetra Tech office in Helena, Montana with a duplicate set of copies forwarded to Volpe on a weekly basis. An individual file will be maintained for each property inspected. Photocopies of all field forms and appropriate logbook pages in each individual property file will be maintained in the Troy field office for the duration of the TAPE project so that information is available if questions arise. The original forms will be stored in the Tetra Tech office in Helena, Montana, for the duration of the sampling, inspection, and reporting phases of the TAPE project. The original forms will be transferred to DEQ at the end of the TAPE project. Copies of the field forms and field logbook will be available on request at any time during the TAPE project to DEQ, EPA, or to the Troy property owners.

After the field forms have been received from the TAPE field teams, the Tetra Tech Field Data Coordinator will check all paperwork and corresponding location, building, and sample ID numbers for accuracy. The Tetra Tech Field Data Coordinator will then transfer the hard copies of the field forms and the associated dust, building material, and soil samples collected for the Troy properties to the CDM Troy Sample Coordinator. The CDM Troy Sample Coordinator will manually enter the information into the eLastic application for ultimate transfer to the Libby V2 database, pursuant to the eLastic data entry SOP (Appendix B). The CDM Troy Sample Coordinator will conduct a 100 percent data check to ensure that all information has been entered correctly. When the data check is complete, the CDM Troy Sample Coordinator will export the data to the Libby V2 database, via Volpe.

Until samples have been transferred to the CDM Troy Sample Coordinator, all TAPE samples will be held by Tetra Tech. Samples may be stored in locked vehicles or in a secured (locked) area of the Troy Tetra Tech field office. All TAPE samples collected from the Troy properties, including QC samples, will be transferred to the CDM Troy Sample Coordinator at least on a weekly basis. The CDM Troy Sample Coordinator will provide Tetra Tech with a copy of a chain of custody, pursuant to the electronic chain-of-custody SOP (Appendix B). The CDM Troy Sample Coordinator will then transfer the samples to the laboratory for preparation and analysis.

Digital photographs will be downloaded daily to a computer at the Tetra Tech Troy field office. Photographs will be downloaded and labeled using a standard labeling procedure that is based on property and building ID numbers. Individual photographs will not be routinely printed from the Troy field office.

6.0 DATA MANAGEMENT

Data management during the inspection and sampling will be under the supervision of the Tetra Tech TAPE Field Data Coordinator in the Troy field office. At the conclusion of inspection and sampling, that responsibility will pass to the Tetra Tech TAPE project manager.

6.1 DATA REQUISITION

The laboratory will report all analytical data to Volpe and Volpe will oversee integration of that data into the Libby V2 database. Tetra Tech and DEQ will obtain sampling data from the Libby V2 database by requesting that data from Volpe (through EPA) on a standard information request form. Tetra Tech will request the following information from the Libby V2 database for each sample, including QC samples, collected during the TAPE project:

- Sample location
- Sample name
- Sample date
- Sample results
- Identification numbers, dates, and results for laboratory quality control samples

Volpe will provide this information (through EPA) in the standard Libby V2 data report format. All other information necessary for reporting purposes will be obtained from Tetra Tech internal files (copies of IFFs, FSDSs, property sketches, and logbooks).

6.2 DATA REPORTING

Data from the Libby V2 database will be obtained through a geographic information system interface software (ArcView). This interface will provide maps showing all TAPE sample locations. Dust and soil sampling results will be provided from the Libby V2 database in tabulated form, as Microsoft Access files. Tetra Tech will prepare a TAPE project report that describes the activities conducted, the results of the property inspections, and the results of the sampling, evaluates data quality, and recommends follow-up actions. The TAPE project report will include maps for each property where asbestos in soil or in dust exceeded screening levels. TAPE project maps will show sample locations and results for the property and delineate the areal extent of asbestos.

7.0 QA/QC PROCEDURES

The TAPE quality objectives, QC checks and samples, and audits completed for the TAPE project are described in the sections below. Field quality control procedures are described in Section 5.0 above.

7.1 QA/QC OBJECTIVES

The quality objectives of the TAPE project are to obtain 100 percent usable and accurate data. These data will be achieved through inspection and sampling using standardized field forms and procedures, auditing field operations, observing chain of custody procedures, and analyzing field quality control samples and laboratory quality control samples. The DQOs are further discussed in Section 3.0 of this Work Plan.

7.2 INTERNAL QC CHECKS

When laboratory analytical data are received, Volpe will conduct a thorough quality review of that data. Volpe will review data from both laboratory QC samples described below and field QC samples described in Section 5.2. Standard protocols exist for validation of soil samples analyzed by PLM for asbestos and will be followed. Standard protocols do not exist for validation of dust samples for asbestos; however, EPA and their contractors will follow the QC review procedures for dust data established at the Libby Asbestos Superfund Site. EPA and their contractors will prepare validation and review packages for all TAPE data and will transmit the reports to Tetra Tech to be included in the TAPE project report.

Dust and soil samples will be analyzed by one of the contract laboratories following Libby Asbestos Superfund Site protocols, including EPA's most recent protocols relating to QA/QC for the Libby Asbestos Superfund Site. As such, the QA/QC protocols followed by the laboratories are not within Tetra Tech's immediate control.

Laboratory QA/QC samples and standard protocols that the contract laboratory will perform for routine analysis will include appropriate laboratory procedures for the analyses of the following sample types:

- Preparation Duplicate Samples
- Preparation Laboratory Equipment Blanks (grinding and other equipment)
- Method Blank Samples
- Matrix Spike/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Duplicates

- Standard Reference Material
- Surrogates

Volpe will enter data into the Libby V2 project database with a 100 percent QC of the data.

7.3 AUDITS, CORRECTIVE ACTIONS, AND QA REPORTS

Field audits will be an integral part of Tetra Tech's field operations for the duration of the TAPE project. Field audits and corrective actions will be the responsibility of the Tetra Tech QA/QC manager. (See Section 2.0 and Table 2-1 for designated key project personnel.) The TAPE project report will include a discussion of data quality that will include a summary of field audit results. Copies of field audit forms will be provided as an appendix to the TAPE project report.

7.3.1 Field Inspections and Sampling Procedures Audits

The Tetra Tech QA/QC manager will be responsible for audits of TAPE field inspections and sampling procedures. Audits will be conducted daily for the first 5 days of inspection and sampling and at least biweekly for the duration of the TAPE. Audits will consist of the QA/QC manager or his designee attending a Troy property inspection and sampling event and observing the TAPE field team's activities. The field team will not be warned of the audit. The auditor will compare the field team's activities with the protocols provided in this Work Plan and the attached SOPs and evaluate compliance with the protocols using the audit form provided in Appendix E. After the audit, the auditor will provide the completed audit form to the DEQ and Tetra Tech project managers.

7.3.2 Corrective Action Procedures

The QA/QC auditor may use his or her discretion to provide immediate verbal feedback to the TAPE field team if necessary to ensure that deficiencies are fixed as quickly as possible. The Tetra Tech field team leader and QA/QC manager will review the report with the TAPE field team within 48 hours of the audit to correct any deviations or deficiencies. If any deviations or deficiencies were noted, the field team will be audited again within 1 week of the original audit to ensure that any deficiencies have been fixed.

If gross deficiencies are noted, the Tetra Tech QA/QC manager will determine whether re-inspection or re-sampling of any Troy properties is required. Re-inspection or re-sampling will be required only if the

TAPE field team failed to correctly identify VCI during inspection, collected samples incorrectly, or collected a grossly inadequate number of samples.

7.3.3 Laboratory Audits

The EPA contract laboratories used to analyze the Troy project samples will be required to provide proof of current certifications. Examples of certifications include the following: American Industrial Hygiene Association and the National Voluntary Laboratory Accreditation Program. The verification of laboratory certifications and QC controls will be under the jurisdiction of Volpe or EPA. These agencies are responsible for conducting the laboratory audits if required.

REFERENCES

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APPENDIX A

SITE-SPECIFIC HEALTH AND SAFETY PLAN
TROY ASBESTOS PROPERTY EVALUATION

APPENDIX B

STANDARD OPERATING PROCEDURES (SOPs)
TROY ASBESTOS PROPERTY EVALUATION

Tetra Tech - Troy

- Tetra Tech TAPE FSDS and IFF Completion Guidance, Version 01
- Tetra Tech TAPE Soil Sampling Guidance, Version 01

CDM/EPA – Libby

- CDM-Libby-03 Completion of Field Sampling Data Sheets
- CDM-Libby-04 Completion of Inspection Field Forms
- CDM-Libby-05 Site-Specific Standard Operating Procedure for Soil Sample Collection
- CDM-Libby-07 CSF eLASTIC Module

American Society for Testing and Materials (ASTM)

- ASTM D5755-95

Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Building Number Concentrations

APPENDIX C

EQUIPMENT/SUPPLIES LIST
TROY ASBESTOS PROPERTY EVALUATION

APPENDIX D

SAMPLE COVER LETTER, ACCESS AGREEMENT, AND SAMPLE RECEIPT
TROY ASBESTOS PROPERTY EVALUATION

APPENDIX E

FIELD FORMS
TROY ASBESTOS PROPERTY EVALUATION

DRAFT

TROY ASBESTOS PROPERTY EVALUATION WORK PLAN (FIELD SAMPLING PLAN AND QUALITY ASSURANCE PROJECT PLAN)

FOR THE

TROY ASBESTOS PROPERTY EVALUATION PROJECT

Troy Operable Unit of the Libby Asbestos Superfund Site

March 2006

Prepared for:

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
Remediation Division
P.O. Box 200901
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DRAFT

TROY ASBESTOS PROPERTY EVALUATION WORK PLAN (FIELD SAMPLING PLAN/QUALITY ASSURANCE PROJECT PLAN)

FOR THE

TROY ASBESTOS PROPERTY EVALUATION PROJECT

Prepared for:

MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY

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Appendix

FIGURES

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TABLES

ACRONYMS AND ABBREVIATIONS

AHERA	Asbestos Hazard Emergency Response Act
amsl	Above mean sea level
ASTM	ASTM International (formerly the American Society for Testing and Materials)
CDM	Camp Dresser & McKee
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
cm^2	Square centimeters
CPR	Cardiopulmonary resuscitation
DEQ	Montana Department of Environmental Quality
DPHHS	Montana Department of Public Health and Human Services
DQO	Data quality objective
eLastic	Electronic Libby Asbestos Sample Tracking Information Center
EPA	U.S. Environmental Protection Agency
FSDS	Field sampling data sheet
GPS	Global positioning system
HASP	Health and safety plan
HAZWOPER	Hazardous waste operations
IFF	Inspection field form
LA	Libby amphibole
Microvac	Microvacuum
mm	Millimeters
OSHA	Occupational Safety and Health Administration
OU	Operable unit
PPE	Personal protective equipment
PLM	Polarized light microscopy
QA	Quality assurance
QC	Quality control
SOP	Standard operating procedure
TAPE	Troy Asbestos Property Evaluation
Tetra Tech	Tetra Tech EM Inc.
µm	Micrometers

ACRONYMS AND ABBREVIATIONS
(continued)

VCI	Vermiculite-containing insulation
Volpe Center	John A. Volpe National Transportation Systems Center

1.0 PROJECT DESCRIPTION AND BACKGROUND

Tetra Tech EM Inc. (Tetra Tech) received Task Order No. 41 from the Montana Department of Environmental Quality, Remediation Division (DEQ), under DEQ Contract No. 402014. The purpose of this task order is to complete a Troy Asbestos Property Evaluation (TAPE) Work Plan for the Troy Operable Unit (OU) of the Libby Asbestos Superfund Site. The United States Environmental Protection Agency (EPA) is the lead agency for the Libby Asbestos Superfund Site. DEQ is the lead agency for the Troy OU through a Cooperative Agreement with EPA. EPA requested DEQ lead the Troy OU for efficient resource allocation. The TAPE Work Plan describes the field and property inspections and sample collection necessary to identify if and where asbestos is present within the Troy OU and the concentrations and quantity, if present. This information will be used at a later date to support cleanup decisions.

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This TAPE Work Plan document is a combined field sampling plan and quality assurance project plan and is referred to as the TAPE Work Plan. Tables and figures in this document follow the first reference in the text. Appendix A contains the site-specific health and safety plan (HASP), Appendix B contains copies of project-applicable standard operating procedures (SOPs), Appendix C is a list of equipment and supplies required for the project, Appendix D contains samples of information for residents, and Appendix E contains example TAPE project field forms.

1.1 PROJECT BACKGROUND AND PURPOSE FOR SAMPLING

Troy, Montana, is located 18 miles northwest of Libby, Montana. From the 1920s until 1990, an active vermiculite mine and associated processing operations were located at Libby. While it was in operation, the vermiculite mine in Libby may have produced 80 percent of the world's supply of vermiculite (EPA 2005). Vermiculite is used primarily for insulation in buildings and as a soil amendment. The vermiculite deposit is contaminated with a form of amphibole asbestos (Libby amphibole [LA]) that is considered a carcinogen. Asbestos is a known carcinogen and is associated with a multitude of respiratory health effects, including asbestosis, lung cancer, and mesothelioma. For decades, vermiculite ore and waste materials were ubiquitous in the Libby community while the mine operated and after its closure.

In 1999, EPA Region 8 dispatched an emergency response team to investigate in response to media reports that described a high rate of asbestos-related deaths in Libby. The Agency for Toxic Substances and Disease Registry (ATSDR) has since determined that between 1978 and 1998 asbestosis mortality in

Libby was 40 times to 80 times higher than expected in Montana and the United States, and lung cancer mortality was approximately 20 percent to 30 percent higher than expected in Montana and the United States (ATSDR 2002). Originally believed to be a problem limited to the mine workers, the scope increased. Subsequent environmental investigations have found many areas in and around Libby contaminated with LA. EPA began Time Critical Removal Actions in Libby in 1999 through a two-phased approach. The Phase I investigation was used to determine if a time critical removal action was warranted in Libby to protect human health, to identify potential major source areas, and to identify the appropriate analytical methods for measuring concentrations of LA in those source materials (CDM 2002). The Phase II investigation was used to collect detailed information about airborne concentrations in air that result from sources of contamination that are disturbed (CDM 2003b). The combined results from the Phase I and II investigation include:

- Exposure to LA is a threat to human health.
- Release of respirable LA fibers occurs when source materials are disturbed.
- Source materials include vermiculite insulation, vermiculite products (building materials) and process wastes, and contaminated soils.
- Contaminated indoor dust found in residential and commercial properties is a potential exposure pathway.
- There is widespread presence of LA throughout the Libby area.

As a result of the findings from the Phase I and II investigations, and because the Libby Asbestos Superfund Site was listed on the National Priorities List in 2002, EPA further investigated residences and businesses in the Libby study area boundary (EPA 2003b). EPA began the Libby Asbestos Superfund Site Contaminant Screening Study, which was considered the first part of the Remedial Investigation, in 2002. The goal of the Contaminant Screening Study was (and is) to determine which properties in Libby contained LA source materials (CDM 2003a). As of December 2005, EPA and their contractors have investigated 4,029 properties in the Libby area through the Contaminant Screening Study.

The purpose of the TAPE is identical to that of the Contaminant Screening Study. Limited investigations thus far have found the vermiculite insulation found in Troy is morphologically similar to that in Libby (include the USGS reference). The draft Troy Site Conceptual Model (Section 1.2) illustrates that potential exposures in Troy are similar to those in Libby, therefore, a systematic screening of Troy area residences and business is necessary to gather sufficient information to determine how many Troy area properties are contaminated with LA. Some vermiculite mine workers lived in Troy and commuted to the mine to work each day. The mine

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workers were exposed to asbestos-contaminated materials at the mine and processing facilities, and they transported asbestos-contaminated dust to their homes on clothes and equipment. Residents of Troy also traveled to Libby for everyday activities such as shopping, working (other than at the mine), and attending school sporting events and likely came in contact with LA in Libby during these frequent visits. In addition, the asbestos-contaminated vermiculite ore and waste materials in varying forms may have been used for amending soils (as fill or as a conditioner), building materials (plaster, concrete, or chinking amendment), and for insulating buildings in and around Troy.

1.2 SITE CONCEPTUAL MODEL

Wasn't there some discussion about outdoor air from soil amendments being disturbed? Look at the SCM on the PowerPoint slide from Bill Bratien.

Asbestos exposure is a potential human health concern because chronic inhalation of excessive levels of asbestos fibers suspended in air can result in lung diseases such as asbestosis and mesothelioma. The relationship between asbestos exposure and mesothelioma has been documented, and at least 70 percent of people with mesothelioma report that they have been exposed to asbestos (National Cancer Institute 2005). Figure 1-1 presents a draft Site Conceptual Model for Troy, which identifies exposure pathways by which asbestos fibers from the Libby mine might be inhaled or ingested by humans. The draft Site Conceptual Model will be refined as additional data are acquired and the understanding of actual transport and exposure pathways for Troy is improved. EPA, CDM, and the Montana Department of Public Health and Human Services (Montana DPHHS) have provided additional related background information for the Libby asbestos project and on mesothelioma in Montana (CDM 2003; Montana DPHHS 2005).

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1.3 TROY SITE INFORMATION

The Troy OU is located along the Kootenai River valley at an elevation ranging from 1,850 feet above mean sea level (amsl) at the northern end of the OU to 2,500 feet amsl on the mountain slopes surrounding the valley. The Troy OU is approximately 8 miles long and up to 1.8 miles wide. Topography of the Troy OU consists of relatively flat river valley terraces on both sides of a gently graded Kootenai River. Several tributaries flow into the Kootenai River along the 8-mile stretch contained within the Troy OU. Figure 1-2 provides a topographic view of the Troy OU boundaries.

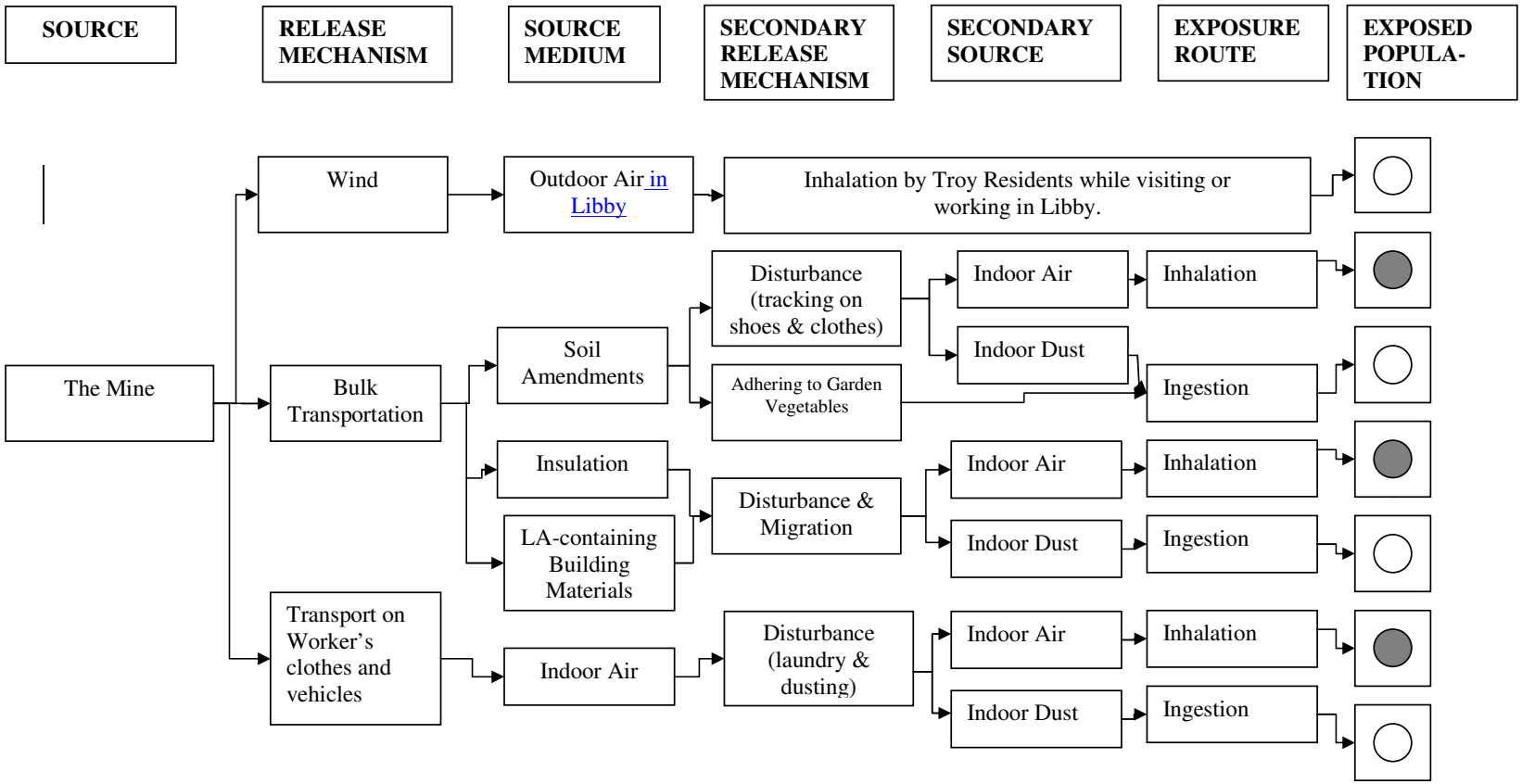

Figure 1-1: Site Conceptual Model – Potential Human Exposure Pathways to Asbestos at the Troy Operable Unit, Libby MT Superfund Site

Figure 1-2: Topographic View of the Troy OU

1.4 SCHEDULE

The schedule for the TAPE inspection and sampling field work is pending DEQ receiving adequate EPA funding. The TAPE field work may begin in the summer 2006 and would require approximately 75 full work-days to complete (15 weeks) based on an average of 15 total TAPE inspections per full day. The soil and dust samples collected from the TAPE field work will be prepared for analysis by CDM and analyzed for asbestos concentrations by a contract laboratory. Analysis of the samples is also dependent upon adequate EPA funding. Tetra Tech will prepare a TAPE Field Summary Report approximately 90 days after the completion of the field work. The draft TAPE project report would be submitted to the DEQ and others approximately 60 days after receiving the analytical data.

1.5 REPORT ORGANIZATION

This TAPE Work Plan is organized into eight sections. Section 1.0 is this introduction. The contents of Sections 2.0 through 8.0 are briefly described below.

- Section 2.0 Project Organization. This section identifies key project personnel and project responsibilities and provides an organizational chart and a table of participants with contact information.
- Section 3.0 Work Plan Rationale. This section describes the data quality objective (DQOs) steps used to establish the quantity and the quality of data to support decision making.
- Section 4.0 Field Procedures. This section describes the activities that will take place during the property evaluations. The SOPs for each activity and the HASP are referenced and detailed.
- Section 5.0 Field Quality Control Procedures: This section discusses the field quality assurance and quality control (QA/QC) procedures, including equipment decontamination, QA samples, field documentation, and chain of custody. Also discussed in this section are QA procedures used at the Libby Asbestos Superfund Site (EPA 2000c).
- Section 6.0 Data Management. This section describes how the data will be handled after they have been received from the Libby V2 database.
- Section 7.0 QA/QC Procedures. This section will describe the procedures that will be taken to ensure the quality and integrity of the TAPE data.

Finally, references used in preparing this document are presented in Section 8.0.

2.0 PROJECT ORGANIZATION

Table 2-1 presents the responsibilities and contact information for key personnel involved in the TAPE inspection and sampling project. In some cases, more than one responsibility has been assigned to a person.

The John A. Volpe National Transportation Systems Center (Volpe Center) is providing support to EPA Region VIII, including management of the Libby V2 database which is used to track sampling, analytical, and other pertinent data from the Libby Asbestos Superfund Site. Tetra Tech will transfer Troy data to and obtain data from EPA and their contractors. Tetra Tech will transfer custody of all soil and dust samples to CDM after the samples have been recorded and organized. CDM will then be responsible for custody and quality assurance of the samples until delivery to a contract laboratory for analysis. CDM contracts all analytical laboratories used for the Libby Asbestos Superfund Site. Therefore, CDM will oversee laboratory schedules and track data deliverables.

2.1 MONTANA DEQ OVERSIGHT

The DEQ Project Officer (or designee) will provide oversight of all field activities associated with this TAPE project. DEQ oversight personnel will have the ability to inspect all field and sampling activities, determine the appropriateness of the recorded data, and ensure that all activities comply with standard practices that meet the project objectives. Before any oversight is conducted, the Tetra Tech on-site health and safety coordinator will brief the DEQ oversight personnel to ensure safe practices are maintained throughout the TAPE field effort.

2.2 NON-AGENCY OBSERVATION OF FIELD ACTIVITIES

EPA will be allowed the opportunity to observe the TAPE project field activities. The request for non-Agency observation of field activities must first be coordinated with and approved by the DEQ Project Officer and the individual property owner. When inspection and sampling are being conducted on a Troy property and the owners are present, the property owners will have the opportunity to (1) observe Tetra Tech field inspection and sampling in a safe manner, (2) obtain copies of the field forms and property sketches completed for the property, (3) obtain a receipt for samples collected, and (4) obtain a portion of samples collected (at the cost of the property owner). The Tetra Tech field team will brief property owners about the types of sampling and methods for completing the TAPE inspection and sampling;

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however, the Tetra Tech field team will not interpret results or make conclusions from the inspection and sampling for the property owner.

If Tetra Tech obtains soil or dust samples at a property, Tetra Tech will, if requested, provide the property owner with a receipt for the samples identifying the number and types of samples collected before the field crew leaves the property. No sample results will be available during the TAPE inspection and sampling. An individual property owner who requests a portion of a sample must supply all necessary materials required for sampling, as well as arrange and pay for laboratory analysis of all additional samples collected.

2.3 SPECIAL TRAINING AND CERTIFICATES

Tetra Tech personnel who work on the TAPE project will have met the Occupational Safety and Health Administration (OSHA) training requirements defined in Title 29 Code of Federal Regulations (29 CFR) Part 1910.120(e) for working on hazardous waste sites. These requirements include: (1) 40 hours of formal off-site instruction; (2) a minimum of 3 days of actual on-site field experience under the supervision of a trained and experienced field supervisor; and (3) 8 hours of annual refresher training. In addition, all Tetra Tech personnel working on the TAPE project will have taken the Asbestos Hazard Emergency Response Act (AHERA) 24-hour asbestos inspector training course and will hold a current asbestos inspector license issued by the State of Montana.

Tetra Tech personnel working on the TAPE project must read and abide by the stipulations and guidelines set forth in Tetra Tech's HASP, which is Appendix A to this TAPE Work Plan. The HASP provides written instructions for health and safety training requirements, personal protective equipment (PPE) requirements, spill containment program, and health-hazard monitoring procedures and techniques. At least one member of every Tetra Tech field team will maintain current certification in the American Red Cross "Multimedia First Aid" and "Cardiopulmonary Resuscitation (CPR) Modular" or equivalent.

Copies of Tetra Tech's health and safety training records, including course completion certifications for the initial and refresher health and safety training, specialized AHERA training, and first aid and CPR training, are maintained in the Helena Tetra Tech office files for all TAPE field team members.

TABLE 2-1

KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
Catherine LeCours	DEQ	Project Officer	• Monitors performance of the contractor • Reviews and approves all work plans and QA measures (FSP/QAPP) • Provides coordination with EPA, Volpe, and CDM • Provides primary interface with the Troy community and disseminate project information to the public	Montana Department of Environmental Quality PO Box 200901 Helena, MT 59620-0901 clecours@mt.gov (406) 841-5040
J. Edward Surbrugg	Tetra Tech	TAPE Project Manager	• Responsible for implementing all activities called out in the task order • Supervises preparation of work plan and approves document • Monitors and directs field activities to ensure compliance with work plan requirements • Provides coordination with DEQ Project Officer • Disseminate project information to interested parties and Troy property owners and direct questions to DEQ	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 edward.surbrugg@ttemi.com (406) 442-5588
Mark Stockwell	Tetra Tech	- TAPE Field Team Leader - TAPE QA/QC Manager	• Responsible for directing and coordinating day-to-day field activities conducted by Tetra Tech • Verifies that field sampling and measurement procedures follow work plan • Conducts field audits for QA/QC • Provides DEQ Project Officer and TAPE project manager with regular reports on status of field activities • Disseminate project information to interested parties and Troy property owners and direct questions to TAPE project manager or DEQ	Tetra Tech, Sandpoint 7 West 6th Avenue Sandpoint, ID mark.stockwell@ttemi.com (208) 263-4524

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TABLE 2-1
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KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
Jessica Allewalt	Tetra Tech	Troy Field Data Coordinator	• Responsible for working with TAPE project manager and TAPE field team leader to schedule TAPE inspections • Responsible for compiling, organizing, and auditing field data sheets and samples submitted daily by field teams • Responsible for transferring field data sheets and samples to the CDM Troy Sample Coordinator • Coordinate with CDM, EPA, and Volpe managers on sample delivery schedules and logistics • Reviews laboratory data before release to project team • Disseminate project information to interested parties and Troy property owners and direct questions to TAPE project manager or DEQ	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 jessica.allewalt@ttemi.com (406) 442-5588
Joe Faubion	Tetra Tech	On-site TAPE Safety Officer	• Responsible for implementing health and safety plan and for determining appropriate site control measures and personal protection levels • Conducts safety briefings for Tetra Tech and site visitors • Can suspend operations that threaten health and safety • Disseminate project information to interested parties and Troy property owners and direct questions to TAPE project manager or DEQ	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 brett.veltri@ttemi.com (406) 442-5588
Ed Madej	Tetra Tech	Database and Geographic Information System Manager	• Responsible for developing, monitoring, and maintaining project database and property maps • Responds to requests from TAPE project manager and TAPE field team leader to provide copies of property maps to field teams on a daily basis • Works with CDM, Volpe, and EPA data and graphic managers to generate needed reports and maps from the Libby V2 database	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 ed.madej@ttemi.com (406) 442-5588

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TABLE 2-1
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KEY PERSONNEL

Name	Organization	Role	Responsibilities	Contact Information
10 members	Tetra Tech	Field Team Member	• Responsible for conducting TAPE inspections and sampling as described in the work plan and for following SOPs. • Disseminate project information to interested parties and Troy property owners and direct questions to TAPE project manager or DEQ	Tetra Tech, Helena, MT 7 West 6th Avenue Helena, MT 59601 (406) 442-5588
TBD	CDM Troy Sample Coordinator	Troy Sample Coordinator from CDM	• Accepts FSDSs and corresponding samples from Tetra Tech • Responsible for quality review of electronic data entered by Tetra Tech • Coordinates with the CDM laboratory coordinator regarding laboratory or archive storage assignments • Prepares chain-of-custody forms (COCs); ships or hand delivers samples as necessary • Coordinates with the Tetra Tech Field Data Coordinator regarding laboratory sample/data issues; assists in the revision of FSDSs, electronic data, and COCs as necessary • Exports electronic data to the Volpe data manager (for upload into the Libby V2 database) and resolves any export file issues • Provides general quality control input for consistency with Libby project sample and data collection requirements	Troy Field Office TBD
Courtney Zamora	Volpe Center, US DOT	Libby Site Manager/Field Representative	• Field Representative for Volpe Center • Review documents from Troy for consistency with Libby • Respond to resident's requests and concerns in Libby	EPA Information Center 501 Mineral Ave Libby, MT 59923 (406) 293-6194 Courtney.zamora@volpe.dot.gov
Shawn Oliveria	CDM	Libby Site Health and Safety Manager	• Health and Safety Manager for Libby Asbestos Project • Handle regulatory compliance for all dirty work operations and material handling procedures.	CDM Libby Office 60 Port Blvd Libby, MT 59923 (406) 293-8595 (office) (406) 293-1547 (cell)

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<#>Manage the Lincoln County Asbestos Landfill. ¶

TABLE 2-1
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KEY PERSONNEL

Mike Cirian	EPA	Remedial Project Manager/ Environmental Engineer	• On-Site Remedial Project Manager for the Libby Asbestos Superfund Site • Manage construction activities • Resolve conflict and respond to residential inquiries in Libby	EPA Information Center 501 Mineral Ave Libby, MT 59923 (406) 293-6194 Cirian.mike@epa.gov

Notes:

CDM	Camp Dresser & McKee	DEQ	Montana Dept. of Environmental Quality
EPA	U.S. Environmental Protection Agency	FSP	Field Sampling Plan
QAPP	Quality Assurance Project Plan	SOP	Standard Operating Procedure
TAPE	Troy Asbestos Property Evaluations	TBD	To be determined
Volpe	John A. Volpe National Transportation Systems Center	Tetra Tech	Tetra Tech EM Inc.
QA/QC	Quality Assurance/Quality Control		

Before work begins at a specific project site, Tetra Tech personnel are required to undergo site-specific training that thoroughly covers the following areas:

- Names of personnel and alternates responsible for health and safety at a project site
- Health and safety hazards present on site, including heat, physical stressors, insects and other potential biological hazards
- Selection of the appropriate personal protection levels
- Correct use of PPE
- Work practices to minimize risks from hazards
- Safe use of engineering controls and equipment on site
- Medical surveillance requirements, including recognition of symptoms and signs that might indicate overexposure to hazardous substances, physical stressors (heat, cold), and other potential hazards
- Contents of the HASP

3.0 TROY DATA QUALITY OBJECTIVES

This section presents the DQOs for the TAPE inspection and sampling project. The DQOs are qualitative and quantitative statements developed through the seven-step DQO process (EPA 2000a, 2000b). The DQOs help to clarify the study objectives, define the most appropriate data to collect and the conditions under which to collect the data, and specify tolerable limits on decision errors that will be used as the basis for establishing the quantity and quality of data needed to support decision-making. The DQOs are used to develop a scientific and resource-effective design for data collection. The seven steps of the DQO process for this TAPE project are presented in Table 3-1.

Background information for the Troy OU study area was discussed in Section 1.0 as was a draft Site Conceptual Model (Figure 1-1). The Troy properties, where sources of LA contamination may be found, are not predictable; DEQ has therefore determined that each property in the Troy OU (including privately-owned and publicly-owned property) will be investigated and screened. The properties may or may not contain a building, or multiple buildings; specific use areas (gardens, former gardens, flower beds, gravel and dirt driveways, and play areas; all are areas with potentially greater exposure or greater use of vermiculite amendments); and yards and open space.

The DQOs will be used to design the TAPE project so that the sampling and analysis are appropriate to provide information to EPA regarding the properties with vermiculite-containing insulation (VCI) and other potential sources of LA contamination (vermiculite, building materials, or soil) within the Troy OU.

TABLE 3-1

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY OPERABLE UNIT

STEP 1: State the Problem

Section 1.0 of this Work Plan summarizes the history of the Libby Asbestos Superfund Site, identifies the key players and decision makers, illustrates the Site Conceptual Model, provides justification for the investigation and screening for the Troy OU, and identifies the schedule, budget, and necessary resources.

The following are problem statements associated with the Troy Properties investigation:

- Exposure to LA-contaminated vermiculite is a threat to human health (EPA 2000c).
- Respirable LA asbestos is released when source materials are disturbed (EPA 2000c).
- Potential source materials include VCI, LA-containing building materials, vermiculite waste products, and soils contaminated with LA.
- Household dust and indoor air are potential exposure pathways.
- LA-contaminated materials may be found randomly in and around Troy.
- All properties within the Troy OU should be evaluated for sources of LA contamination.

STEP 2: Identify the Decisions

Principle Discussion Question: Do sources of LA contamination exist at properties within the Troy OU?

Property Identification Decisions:

- Identify the potential properties to investigate.
- Identify the number of buildings on each property.
- Identify the number of specific use areas, yards, and open space areas on each property.

Sampling Decisions:

Inspect properties within the Troy OU to visually and analytically confirm the presence or absence of LA contamination in attics, other interior building spaces, and exterior areas, and the concentrations of LA if present.

- Where will interior dust samples be collected?
- Where will building material samples be collected?
- Where will exterior soil samples be collected?

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DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY OPERABLE UNIT

STEP 3: Identify Inputs to the Decisions
For each property, inputs to the decision include: • Review of aerial photographs to define individual properties, compile addresses, and determine if the property could be individually bought or sold. • Visual inspections of property to determine location and number of buildings, specific use areas, living spaces, and attics. • Documented visible VCI in attics. • Documented visible VCI and other LA-containing building materials in interior building spaces (including but not limited to walls, crawl spaces, etc.). • Documented visible vermiculite in special use areas, yards, or open space areas. • Interviews with residents, owners, occupants, and employees • Analytical results from samples collected at each property.
STEP 4: Define Study Boundaries
• The Troy OU generally consists of the valley bottom from the north half of Section 25, Township 31 North, Range 34 West, and Section 30, Township 31 North, Range 33 West, east to the junction of Highways 56 and 2, and north to the northern edge of Section 21, Township 32 North, Range 34 West. Figure 1-2 shows the configuration of the study area for the Troy OU. • Some properties (approximately 25) within the Troy OU have previously been inspected and sampled under the Libby OU4 investigation. Data have been recorded in the Libby database for these properties and will be integrated with additional sampling data from the TAPE.

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TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 5: Develop Decision Rules
The Record of Decision for the Troy OU will identify the specific parameters, conditions, and concentrations of LA that determine if a source exists at an individual property and if that source requires cleanup. This Work Plan simply details how DEQ will collect sufficient and defensible information essential to support future cleanup decisions. That information includes conversations with property owners and other anecdotal information regarding historical use of vermiculite, VCI, and other LA containing materials, visual inspections, and sample results. Sampling decisions for the Troy OU are based on sampling protocols and sampling results from the work done in Libby. Cleanup decisions will be based on the presence of and the concentrations of LA. • If VCI is visible in a building attic, then collect dust samples from the living spaces to evaluate the presence and concentrations of LA. • If VCI is not visible in an attic, then collect dust samples from the living spaces to evaluate the presence and concentrations of LA from any secondary indoor or outdoor source of LA. • If vermiculite was used in building materials (plaster, concrete, or chinking), then collect building material samples to evaluate the presence and concentrations of LA from this potential secondary indoor source of LA. • If vermiculite is visible in a building interior, then collect discrete samples to evaluate the presence and concentrations of LA in the area. In addition, collect dust samples from the other building levels or areas to evaluate the presence and concentrations of LA in those living spaces. • If vermiculite is not visible in a building interior, then collect dust samples from the living spaces to evaluate the presence and concentrations of LA from any secondary indoor or outdoor source of LA. • Collect discrete soil samples from specific use areas to evaluate the presence and concentrations of LA. • If the property contains a yard and large open space, then subdivide these areas by similar land uses (for example, grassed areas, driveways, parking areas, and front, back, and side yards) and collect a composite soil sample from each subarea to evaluate the presence and concentrations of LA. Figure 3-1 shows the steps used to inspect and sample buildings and exterior property in the Troy OU. Figure 3-2 provides some typical outdoor soil sampling designs for specific use areas, yards, and open spaces.

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TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 6: Specify Tolerable Limits on Decision Errors

- Sampling and measurement error are associated with environmental data collection and may lead to decision errors. Sampling error occurs when the sample is not representative of the true site conditions. Measurement error occurs because of random and systematic errors associated with sample collection, handling, preparation, analysis, data reduction, and data handling. Decision errors are controlled by adopting a scientific approach that uses hypothesis testing to minimize the potential for error.
- There are two types of decision error: false negative error, and false positive error. A false negative decision error occurs when the null hypothesis is rejected although it is true. The consequences of a false negative error would be that VCI or LA-contaminated dust or soil at a Troy property is not remediated. A false positive decision error occurs when the null hypothesis is not rejected although it is false. The consequences of a false positive error are that unnecessary resources are expended to undertake remedial action to address contaminated media that do not exist at concentrations that exceed action levels or acceptable risk levels.
- Property-specific sampling objectives and the random distribution of vermiculite and LA-contaminant soil limit the usefulness of statistical methods to eliminate sampling error. Therefore, sampling methods and procedures will be based on results from the Libby Asbestos Superfund Site. Tolerable limits on sampling decision errors cannot be precisely defined; however, the decision errors will be minimized by inspecting and screening all properties in the Troy operable unit. Decision errors based on analytical data will be minimized by the use of standard EPA-approved and Libby-specific analytical methods.

STEP 7: Optimize the Sampling Design

- All properties in the Troy OU will be uniquely defined in the work plan, and their locations will be identified using existing Lincoln County records, cadastral databases, and low-level aerial photographs. The number of Troy properties to be investigated will be approximately 1,000.
- Dust and soil samples will be collected using similar methods and standardized procedures that have been employed for the Libby Asbestos Superfund Site OU 4. With more than 4,000 Libby properties sampled since 2001, the methods have been defined (CDM 2002; CDM 2003a; CDM 2003b; EPA 2003a).
- Field QA/QC procedures will be implemented and will include equipment and personnel decontamination, QA samples, field documentation, and sample chain of custody. Scientifically valid and legally defensible data will be supported by collection of dust and soil field blanks and other QA samples at a frequency necessary to assess potential cross contamination from equipment and sample integrity during collection.
- Field sample data sheets, similar to those used in Libby, will be completed for each sample collected and each property inspected within the Troy OU. The field data sheet information will be recorded into the electronic Libby Asbestos Sample Tracking Information Center (eLASTIC) application for uploading to the existing Libby V2 database.

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TABLE 3-1 (continued)

DATA QUALITY OBJECTIVES
INVESTIGATION OF TROY PROPERTIES

STEP 7: Optimize the Sampling Design (Continued)
• Dust and soil samples collected at each Troy property will be uniquely labeled, and sampling information will be recorded into the eLastic application. The paper sample records, along with the samples, will be transferred under chain-of-custody procedures to a CDM sample data coordinator, who will verify completeness and accuracy of the records. • DEQ and its contractor, Tetra Tech, will work closely with EPA, Volpe, and its contractor, CDM, to ensure that sample integrity is maintained throughout and that data quality is adequate to meet project objectives. • CDM will transfer the electronic sampling and field form information to EPA and Volpe and prepare the samples for analysis. • Figure 3-3 provides a schematic diagram of the TAPE process used by Tetra Tech to organize, conduct the property evaluations and sampling, and provide samples and electronic information to CDM, EPA, and Volpe.

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Figure 3-1 TAPE Inputs

Figure 3-2 TAPE Outdoor Soil Sampling Design

Figure 3-3 TAPE Inspection and Sampling Process Diagram

4.0 FIELD PROCEDURES

This section of the TAPE Work Plan describes the field activities to be implemented for the TAPE inspection and sampling project and includes the following tasks:

- Mobilizing and demobilizing
- Obtaining access agreements
- Scheduling inspections with property owners
- Conducting verbal interviews
- Conducting property inspections – indoor, attic, outbuildings, outdoor open spaces, yards, specific use areas (using the inspection field form [IFF])
- Collecting indoor dust samples (recorded on dust sample field sampling data sheet [FSDS])
- Collecting building material samples (recorded on soil-like material sample FSDS)
- Collecting outdoor soil samples (recorded on soil-like material sample FSDS)
- Collecting QA/QC samples
- Decontaminating equipment and personnel
- Containing and disposing of investigation-derived waste

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SOPs, with current amendments, are provided in Appendix B and are referenced throughout this section of the TAPE Work Plan. As appropriate, Tetra Tech has developed project-specific guidance for Troy which is based largely on guidance developed specifically for the Libby Asbestos Superfund Site. The Tetra Tech project-specific guidance and the Libby-specific guidance documents that were used to generate the Troy guidance are listed below and copies are provided in Appendix B.

• Tetra Tech	TAPE FSDS and IFF Completion Guidance
• Tetra Tech	TAPE Soil Sampling Guidance
• CDM-Libby-03	Libby guidance for completing the FSDSs
• CDM-Libby-04	Completion of Information Field Form
• CDM-Libby-05	Site Specific Standard Operating Procedure for Soil Sample Collection

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Health and safety protocols and requirements will apply to all field activities and are summarized below. Information on quality control is provided in Sections 5.0 and 7.0 of this TAPE Work Plan.

4.1 HEALTH AND SAFETY PROCEDURES

The TAPE HASP (Appendix A) and Tetra Tech's corporate health and safety program plan will apply to all field activities undertaken as part of this project. All field staff conducting inspection and sampling activities will be required to:

1. Hold a current OSHA hazardous waste operations (HAZWOPER) 40-hour training certification and up-to-date 8-hour refreshers, as required under 29CFR1910.120;
2. Hold a current asbestos inspector training certificate;
3. Hold a State of Montana asbestos inspector license;
4. Have medical clearance to work wearing a half-face air purifying respirator; and
5. Be quantitatively fit-tested for the specific project respirator within the 12 months prior to the field activities.

The TAPE HASP in Appendix A provides detailed health and safety protocols and requirements, including directions for when to use PPE, such as respirators. All attic entries will be conducted in modified level C PPE that will include a half-face or full-face air purifying respirator with HEPA cartridges. Other property inspection activities, including dust sampling and soil sampling, will be conducted in modified level D PPE. Mr. Joe Faubion will be the Tetra Tech Site Safety Officer for the field activities (see Table 2-1 of this TAPE Work Plan). Negative exposure assessments for the field teams will be performed as necessary, as described in the HASP and at the direction of the Site Safety Officer.

4.2 SITE ACCESS AND LOGISTICS

Section 4.2 provides information about community relations, logistics and schedules, and site access agreements.

4.2.1 Community Relations and Information Centers

Tetra Tech will coordinate with DEQ to ensure that sufficient public outreach (including public meetings, fact sheets, newspaper articles and notices, and radio announcements) is completed before and during implementation of the TAPE. Tetra Tech will provide personnel to attend public meetings in Troy and will help prepare presentation materials, at DEQ's request. Public outreach and information on the

purpose and nature of the TAPE and its role in the overall investigations and cleanup at Troy and Libby are essential to its success.

Tetra Tech and DEQ will set up and staff a field office in Troy at least 1 month before and for the duration of TAPE field activities. The Tetra Tech field office will be the TAPE logistical center for obtaining property access agreements, scheduling field activities, returning samples and field forms at the end of the day, and transferring sample custody from Tetra Tech to CDM. The Tetra Tech field office will also provide a physical location and venue for people in Troy to provide and obtain information about the project. The Tetra Tech field office will also have telephones and answering machines for contacting project personnel when the office is not staffed and after regular hours (Monday through Friday 8:00 am to 5:00 pm). The address and phone number for the Tetra Tech field office will be advertised and posted at the location.

The existing EPA Information Center at 501 Mineral Ave in Libby will also be an information resource for Troy residents, providing access to major project documents. Troy area residents may phone the information center toll free at 1-888-420-6810 or visit the center Monday through Friday from 8:30 a.m. to 5:00 p.m.

DEQ has established a repository for general and Troy-specific information at the City Hall in Troy, located at 301 E. Kootenai. The Troy City Hall is open Monday through Friday from 8:00 a.m. to 5:00 p.m. Tetra Tech and DEQ will continue to provide updated information in City Hall throughout the field sampling activities.

Information about the Libby Asbestos Superfund Site is also available on the Internet at <http://www.epa.gov/region8/superfund/libby.html>. DEQ will maintain updated information regarding Troy on this webpage.

Section 2.0 of this Work Plan discusses the roles and responsibilities of the DEQ and Tetra Tech in community relations.

4.2.2 Logistics and Schedule

Tetra Tech will establish a field office in Troy for the duration of TAPE field activities. Tetra Tech will identify and provide all necessary personnel, sampling equipment, PPE, and project materials for

implementing this Work Plan. All Tetra Tech field personnel will be trained not only in specific tasks but also on the overall objectives of the TAPE. This training will facilitate TAPE implementation and allow for effective communication with the public and other team members.

Tetra Tech personnel will include the TAPE project manager, who will oversee all project activities and logistics and will ensure that the lines of communication are maintained to resolve any issues or concerns that may arise during the field efforts. The Tetra Tech project manager will reside in Helena but will be at the project site in Troy for about 50 percent of the field activities. The TAPE field team leader will be based out of Troy and will be responsible for obtaining site access agreements, assisting with public outreach, scheduling daily field activities, and providing quality control and oversight of the five TAPE field teams. Tetra Tech will also provide a field data coordinator to reside in Troy and assist the project manager and field team leader with daily project tasks. The Tetra Tech Field Data Coordinator will have primary responsibility for checking and cataloging soil and dust samples at the end of each day and for working closely with the CDM Troy Sample Coordinator to ensure that complete, adequate, and secure sample information is collected and transferred to EPA. The detailed responsibilities for these Tetra Tech project personnel are further discussed in Section 5.5.

Tetra Tech will provide five two-person TAPE field teams stationed in Troy for the duration of the field effort. Some substitution and rotation of field staff on and off the TAPE project is expected, but the field staff will work a minimum of 2 weeks before substitutions occur. The Tetra Tech field team leader (Mr. Stockwell) will continuously accompany the field teams to ensure and verify that the teams are conducting the TAPE activities as described and outlined in this Work Plan. The Tetra Tech field teams may conduct limited TAPE inspections on weekends (both Saturday and Sunday) to better accommodate the schedules of Troy property owners. Both members of a field team will be HAZWOPER certified, hold current asbestos inspector licenses, and be trained to properly handle the health and safety protocols for this project.

On average, a Tetra Tech field team will complete three TAPE inspections per day, depending on the complexity of the properties inspected. With five field teams, Tetra Tech can complete an average of 15 total TAPE inspections per full day. If the field inspections continue uninterrupted, Tetra Tech could complete the inspections of more than 1,000 Troy properties in about 75 full work days, or within a 15 week time frame. Tetra Tech's projected schedule for completing the TAPE inspections will be finalized when DEQ receives adequate EPA funding.

4.2.2.1 Communications

Field team members will be provided with cell phones (which will necessitate use of a temporary cell tower), satellite phones, or multi-way radios for the duration of field activities. Contact information, including emergency numbers, for all field teams and for TAPE project management personnel in Helena, Montana, will be stored in the Tetra Tech Troy field office. In addition, the Montana DEQ TAPE Project Officer (Ms. Catherine LeCours), CDM Troy Sample Coordinator, and EPA Libby Asbestos Superfund Site personnel will be provided with contact information for ready access to the Tetra Tech field teams.

4.2.2.2 Equipment

Appendix C details equipment and supplies Tetra Tech identified as necessary for the TAPE field activities described in this Work Plan. Equipment and supplies that are not immediately available to Tetra Tech will be purchased or rented before TAPE field activities begin. Before purchased or rental equipment or supplies will be accepted, the Tetra Tech field team manager will inspect the goods to ensure they are in good condition and free of defects.

4.2.2.3 Pre-Field Activities

Before field crews mobilize to Troy for the TAPE field inspections, Tetra Tech will prepare detailed property maps that identify individual Troy properties. Property boundary and other details will be gathered from public databases (cadastral) and projected onto a high-quality, high-resolution air photograph. Individual Troy property maps will be used during the TAPE field inspections to record approximate locations of the specific use areas and yard samples collected at each property. These property maps will be field checked and may be revised as necessary during the inspections. Tentative inspection and sampling schedules may be based on a block-by-block TAPE inspection pattern. The TAPE inspection schedule will be refined as Tetra Tech schedules the inspections at times and dates convenient to the property owners.

4.2.2.4 Field Team Organization

Five field teams of two people per team will conduct the TAPE inspections and sampling. On average, 15 properties will be inspected and sampled per day. At the start of each day, the field teams will meet at the

Tetra Tech field office for daily safety and organizational briefings (see Section 4.1 and Appendix A HASP).

Before the morning briefing, the Tetra Tech field team leader will have prepared a packet for each property to be inspected and sampled that day. Each packet will include:

- A copy of the signed access agreement or blank access agreement if occupant provided prior verbal agreement,
- Details of the scheduled inspection date and time, and the name and telephone number of the property owner or the person who will be present for inspection and sampling, if different than the property owner,
- A property-specific verbal interview form,
- A property-specific IFF,
- A property-specific FSDS,
- Preprinted property-specific property, building, sample point, and sample identification labels, and
- Two copies of the property parcel maps.

Each field team will have a numbered logbook specific for the Troy project and will be responsible for any additional information included in the logbook. Additional TAPE inspection and sampling supplies (as described in Appendix C, list of supplies) will be kept at the Tetra Tech field office for use by the field teams. The daily briefings will be used to coordinate daily property inspections, calibrate sampling equipment, and collect supplies. The daily briefing will include a review of any issues or problems that arose the previous day, and will provide an opportunity for field team members to ask questions and share lessons learned. At the end of each day, field teams will return to the field office to deliver samples and paperwork to the Tetra Tech Field Data Coordinator, download digital cameras, charge rechargeable equipment, and store field equipment for the evening. Section 6.0 of this Work Plan contains additional logistical details on TAPE data management.

4.2.3 Access Agreements

Approximately 1 month before TAPE field activities begin, Tetra Tech will assist DEQ with mailing access agreements to every Troy property owner where the property has been identified for inspection and sampling. A cover letter will contain information from DEQ on the proposed sampling and contact information for Tetra Tech Troy field office, DEQ, EPA, and the Libby Information Center. The packet

will also contain two copies of an access agreement form and a postage-paid envelope for the property owners to return a completed access agreement. The other copy of the access agreement is for the property owner's records. The cover letter will explain the need for the signed access agreement and encourage any property owners who have questions or concerns about the process to contact the designated parties. An example cover letter and access agreement is provided in Appendix D.

The Tetra Tech project manager and field team leader will manage information mailed in from the Troy property owners, including signed access agreements. Approximately one month after DEQ and Tetra Tech mail the access agreements, a field team of two Tetra Tech personnel will follow up with properties where no response has been received. Follow up contacts (in person or by telephone) will explain the purpose of the TAPE, describe the inspection and sampling process, and answer any pertinent questions. Property owners may provide verbal approval and schedule an inspection; therefore, field teams may obtain a signed access agreement immediately prior to a scheduled inspection.

If property owners are not available during the reconnaissance, the field team will revisit each location at least three times, and the field team leader (or designee) will continue to follow up with personal visits and by telephone. After repeated attempts to contact the property owner by the field teams and the field team leader, Tetra Tech will repeat the mailing with a letter describing the attempts made to contact the property owner.

When the field team leader has received either verbal approval or a completed and signed access agreement either by mail or from a field team, Tetra Tech will contact the property owner by telephone to schedule a TAPE inspection and sampling visit.

Tetra Tech will make reasonable efforts to find a TAPE inspection and sampling date and time that are convenient for the property owner. TAPE inspections and sampling schedules will include evenings (daylight hours only) and weekends, as needed based on the requests of property owners. If property owners respond to the access agreement favorably, but a property is currently uninhabited (for example, it is only seasonally occupied or is currently for sale, or no buildings are present on the property), Tetra Tech will attempt to inspect and sample the property with a designee of the property owner. Properties will not be exempted from inspection or sampling on the basis that they are currently uninhabited, however.

Tetra Tech will not advise property owners of the likely nature of removals at their properties or estimated removal dates during the TAPE scheduling phase, the personal interviews, or the TAPE inspections and sampling. Property owners will be advised that DEQ and EPA will determine removals and schedules after analytical results have been received and evaluated.

Some Troy property owners may be non-responsive or unwilling to sign an access agreement, even when Tetra Tech has attempted to contact them by all reasonable means (telephone, visit to the property, and repeated mailings) to obtain permission for a TAPE inspection and sampling. Tetra Tech will provide DEQ with a list of all Troy properties where the property owner could not be contacted or unwilling to sign an access agreement at the conclusion of TAPE field activities.

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4.3 VERBAL INTERVIEW

The Troy property visit by the TAPE field team will commence with a verbal interview by the field team with the property owner to acquire background information about the property. The field team will interview the property owner using the questions provided on the Interview for Residents/Employees form (Appendix E). Interview topics will include the known or suspected use of VCI or other LA-containing building materials in the house or outbuildings and possible introduction of other sources of LA within or near the property (including garden and landscaped areas and neighboring properties). A unique property identification number (AD-XXXXXX) will be assigned to each individual property that is inspected.

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All buildings encountered during the TAPE inspections will be classified as a primary structure (habitable building, for example, a house, apartment, or main commercial space); or a secondary structure (non-habitable building, such as garages, shops, sheds, barns, or dog houses). The verbal interview will address all primary and secondary buildings and special use, open space, and yard areas located on a Troy property.

4.4 BUILDING INSPECTION, SAMPLE COLLECTION, AND RECORDING PROCEDURES

This section describes the inspection, sampling, and recording to be completed for each TAPE inspection.

4.4.1 Indoor Inspection

The two-person field team will visually inspect each building for the presence of LA contamination. One team member will access and inspect the attic (if safe, present, and reasonably accessible) and will inspect additional areas where VCI may be exposed in living spaces (crawlspaces, closets, and any wall openings). If VCI is observed, the field team member will estimate the quantity based on field measurements or visual estimation, with field measurements (length, width, and height of item) collected wherever possible.

The second team member will document results, including estimated quantities of VCI and other insulation (if present), on the IFF and will record additional pertinent information in the field logbook. As much as is possible in a non-destructive manner, the visual inspection will include checking under other types of insulation (such as blown-in or fiberglass insulation) for VCI. Visual inspections will not involve opening up walls or ductwork to inspect for VCI within the building wall cavities, but will include removal of a representative sample of electrical switch plates to inspect wall interiors. Furthermore, it will include inspecting ductwork in accessible, unfinished areas of the building for VCI. In particular, the field team will note whether utility conduits (including heat/cooling vents) run from the attic to the living space. Visual inspections will not include inspecting the roof.

Attics will be considered reasonably accessible if they can be reached by stairs, hanging stairs, or a non-conductive stepladder (either from the interior or exterior of the building). Attics will be inspected in a manner that, in the judgment of the field team, is not likely to release additional VCI into the living space (exterior access is preferable). The field team will compare exterior roof lines and interior ceiling heights with attic interiors in an effort to identify isolated attic areas that may exist between the roof and the main attic, or between the attic and the interior ceilings. If isolated attics are found, they will be inspected if possible, and barriers between attic areas and access points will be described in the IFF. Attic inspections will also involve inspection of kneewalls (areas where the pitch of the roofline meets the walls). Kneewalls may be used for storage or to improve the finished look of an attic. Kneewalls will be accessed wherever possible, as these areas may provide additional information on construction material. (For example, kneewalls may have unfinished floors compared with the finished floors in the rest of the attic.) If trusses or bracing posts are present in the attic that may pose an obstacle to potential cleanup, these items will be briefly described in the inspection form.

As detailed in the HASP, decontamination zones will be established during the TAPE project, such as at the base of ladders used to access attic spaces or outside of crawl space entrances. These areas will be covered with two layers of polyethylene sheeting during sampling in the attic or crawl space. After personal and equipment decontamination are complete and polyethylene sheeting removed, decontamination areas will be cleaned of debris and residue using appropriate HEPA vacuuming or wet cleaning procedures. Visitors, including building occupants, will not be permitted to enter the decontamination zone without proper qualifications and authorization.

If potted plants are located inside the primary building, the field teams will note whether vermiculite-containing potting soil is present, as this type of soil could affect results of dust sampling.

As described in the HASP (Appendix A), the field team will not be required to access any attics, crawl spaces, or living areas if there is an unacceptable safety hazard, including biological hazards. The field team will not inspect Troy properties for non-VCI and non-LA asbestos. However, damaged or friable suspect asbestos-containing materials that are observed in the inspection will be noted in the field notebook. This information may be of use in interpreting sampling results and planning potential remediation efforts.

The field team may choose to photo-document specific conditions in the building during the TAPE inspection for future reference. The property owner will be asked for permission before any photographs are taken.

TAPE inspections will be documented on IFFs (Appendix E) and in the field logbooks. Pertinent details will include, but are not limited to, identifying the primary and secondary buildings, defining attic spaces, and sketching on the detailed property maps.

As described in Section 4.3, buildings on a property will be classified as primary or secondary. Every primary and secondary building will be subject to a TAPE inspection, an IFF will be completed, and samples collected.

4.4.1.1 Record Building Locations with GPS

As part of the TAPE inspection, the location of each primary and secondary building on the property will be recorded using the backpack-mounted Trimble XRS-Pro global positioning system (GPS). The GPS

location will be recorded at the primary entrance to each building. If the building is on the air photo, the primary entrance and thus the approximate GPS location and corresponding building identification number will be noted on the air photo. Coordinates will be saved on the GPS with a unique identification number that starts with the notation "BD-XXXXXX," where "BD" indicates a building location, and will also be recorded by the field team on the IFF, at the primary entrance to the building on the air photo (if building is shown), and in the field logbook.

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4.4.2 Indoor Dust Sampling

Dust samples will be collected using microvacuum (microvac) sampling techniques in all primary buildings, regardless of whether VCI or other LA-containing building materials are observed. Asbestos is not visible to the unaided eye and not all sources (historical or current) may be identified through the verbal interview or during visual inspection, therefore, dust samples are collected at all properties. Dust samples will be collected following the procedures provided in American Society for Testing and Materials (ASTM) *Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Concentrations* (D 5755-95), as amended for the Libby Asbestos Superfund Site. A copy of this standard ASTM method is provided in Appendix B, with site-specific applications described below (ASTM 1995).

The decision to use microvac sampling, rather than wipe sampling, for the TAPE inspection and sampling was based primarily on the need to collect data that are consistent with data collected for the Libby Asbestos Superfund Site. EPA, and its contractor CDM, have used microvac sampling methods to collect the indoor dust samples in Libby. Microvac sampling methods are assumed to collect samples that more accurately measure releasable asbestos fibers when compared with wipe samples. Each indoor dust sample will be composed of a three-point composite sample, as described in the above-mentioned ASTM standard (ASTM 1995), as amended.

4.4.2.1 Select Sampling Locations

The TAPE field team will select sample locations based on the team's visual inspection of the buildings and estimation of where contaminated dust is most likely to be found. The number and locations of dust samples will be selected as described below.

Primary and Secondary Buildings

Dust samples will be collected in every primary and secondary building regardless of whether LA contamination was observed during the visual inspection.

- Two dust samples will be collected on each level of the building's living space (including finished basements):
  - One three-point composite sample will be collected from accessible horizontal surfaces (for example, windowsill, shelving, and cabinets). The TAPE field team will select the surface or surfaces based on factors including proximity to observed VCI and dust accumulation. (Preference will be given to surfaces with higher dust accumulation that are closer to observed VCI.)
  - One three-point composite sample will be collected from high-traffic walkways, which will be selected by the TAPE field team based on the most probably walkway for tracking contamination into the building, including walkways adjacent to entry doors on the main floor. It will include main walkways and corridors between living areas on upper floors and in basements without walk-out access. Walkways may be solid surfaces or covered with rugs and carpets, or a combination. Samples will not be collected from temporary floor coverings that may be routinely cleaned or discarded.
- One three-point composite sample will be collected from each unfinished basement, if present. This sample will be collected from both walkways and horizontal surfaces inside the basement, with specific aliquots selected at the discretion of the TAPE field team.
- One three-point composite sample will be collected from each attached garage or shop, if present. This sample will be collected from both high-traffic walkways and horizontal surfaces inside the attached building, with specific aliquots selected at the discretion of the TAPE field team.
- No dust samples will be collected in attics or crawlspaces with visible LA contamination. Based on extensive sampling and analytical results from the Libby Asbestos Superfund Site, VCI found in attics and crawlspaces is assumed to be contaminated with LA fibers (EPA 2003b).
- The field team may choose to collect additional, targeted dust samples if migrating VCI is observed in the living space of a primary structure. These data would be used to design small scale vermiculite removal actions if necessary.

4.4.2.2 Dust Sample Collection

Collecting a microvac dust sample involves vacuuming dust from a surface and drawing the sample through a filter designed to capture particulates larger than 0.45 micrometers (µm). The ASTM method D5755-95, as amended for the Libby Asbestos Superfund Site, provides the procedural details for properly collecting a microvac dust sample (Appendix B, ASTM 1995).

The microvac device will consist of a battery-operated low-volume sampling pump connected to a 25-millimeter (mm) vacuum dust sampler cassette. The analytical laboratory will provide the cassettes and tubing. The cassettes will contain a 0.45-µm mixed cellulose ester filter. A 6.35-mm diameter plastic

tubing will be used to connect the cassette to the pump. A 25- to 37.5-mm length of 6.35-mm diameter tubing will be used to create a "nozzle" on the cassette for sampling. The nozzle tubing will be cut at the sampling end at an approximate 45-degree angle.

The pump will be calibrated each morning in the Tetra Tech field office using a standard calibration device such as a Dry-Cal. The pump will be calibrated using a 25-mm vacuum dust sampler cassette to simulate field operation. The flow rate used for sampling will be approximately 2 liters per minute, which provides an approximate air velocity of 100 centimeters per second through the 6.35-mm diameter tubing. The field teams will be equipped with one back-up pump to ensure proper operation and may return to the field office for recalibration as necessary.

The sampling area for each dust sample point (aliquot) will be 100 square centimeters (cm^2) delineated using a fixed template provided with the sampling cassettes. The aliquot sample will be collected by activating the pump and passing the angled nozzle across the delineated surface for 2 minutes.

Each indoor dust sample will contain three sample aliquots; that is, three separate 100 cm^2 surfaces will be vacuumed using one cassette. The cassette will therefore contain dust from a total 300 cm^2 surface area. To collect aliquots, the pump will be turned off and the sampling device moved to the next sample point. Once the next aliquot area has been delineated using a template, the pump will be turned on and the next 100 cm^2 surface area will be vacuumed. When all three sample aliquots have been collected, the sampling device will be turned upside down so that any loose dust falls into the cassette. The exterior of the cassette and nozzle will be wiped clean with a wet towel (wet wipe). The cassette will be detached from the pump, the cap returned to the cassette, and the cassette and the nozzle will be placed in a re-closable plastic bag for shipment to the laboratory (see Appendix B for detail). The nozzle will be included in the shipment because significant quantities of dust can remain in the nozzle. The sample will be labeled using the pre-printed sample labels and will be wrapped for return to the Tetra Tech field office. Dust samples will be labeled with a unique sample identification number "TT-XXXXX" where "TT" indicates a "Troy TAPE" sample. Chain-of-custody procedures will be followed as described in Section 5.5.2.

Indoor dust sample point locations will be described and recorded in the TAPE field logbook and on the FSDS and may be photographed and sketched on the property map at the discretion of the field team.

4.4.3 Building Materials Sample Collection

The TAPE field team may encounter some building materials (for example, chinking between log in log homes, special concrete with vermiculite added, and lathe and plaster walls) include vermiculite within the building materials. These special building materials, when encountered, will be sampled (with as little disturbance as possible to the building's finish) and information recorded in the logbook and on a soil-like materials FSDS. The building material samples will be labeled with a unique sample identification number "TT-XXXXX", where "TT" indicates a "Troy TAPE" sample. Wasn't there an ASTM method to cite? Do we wet down the area first? Any more details to offer? Each sample team has a spray bottle?

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4.4.4 Outdoor Inspection

All areas of the Troy properties that are not covered with buildings will be inspected for vermiculite product in soil and surface materials. The areas of the Troy properties that are not covered by buildings will be grouped into two general types: (1) outdoor yards and open space, and (2) specific use areas. Figure 3-2 provides typical outdoor soil sampling designs for these two general types of outdoor areas.

Special attention will be paid to areas where known sources of LA may have been introduced (including fill areas) and to "high traffic areas" where potential LA is likely to be tracked indoors. The TAPE field team may further subdivide the outdoor yards and open space by land use types, such as yards or grassy areas; driveways; parking areas, and filled areas, if known or visible. Sketches will be drawn on the individual property maps to show the separate land use areas. The property sketch will also show fences, large trees, or other potential obstructions to potential future remediation. Properties that do not have yards, such as commercial properties, will be described as such on the IFF and in the field logbooks; outdoor areas such as paved parking or driveways will still be inspected. As best identified by the property owner, property boundary lines will also be noted on the IFF.

One member of the TAPE field team will visually inspect each area for the presence of vermiculite product or LA-containing rock while the second team member documents the locations and estimated quantities of observed vermiculite product on the IFF and in the field logbook. Locations of vermiculite product observed will also be sketched on the property map. Visual outdoor property inspections will not include digging below the soil surface or destructive techniques to investigate underneath asphalt or concrete. It will not be necessary to delineate the vertical extent of contamination because the default excavation depth for remediation of specific use areas is 18 inches below ground surface (EPA 2003b).

Similarly, the default excavation depth for remediation of general yard areas, open space, and driveways is 12 inches below ground surface (EPA 2003b).

Specific use areas include current and former flower beds, current or former gardens, planters, compost piles, play areas, gravel or dirt driveways, and stockpiles. These areas will be included in the inspection. Visual inspections of specific use areas will include limited digging below the soil surface with the least disturbance possible.

The field team may elect to photo-document specific conditions on the property for future reference. The property owner will be asked for permission before photographs are taken.

4.4.5 Outdoor Soil Sampling

After the visual inspection of the property has been conducted, the TAPE field team will collect soil samples from special use and yard areas following the procedures described below and in the Tetra Tech's project-specific guidance (Appendix B). Soil will be sampled regardless of the results of the visual inspection. Soil sampling will include the following steps:

- Identify sampling locations
- Collect samples
- Record locations on Troy property map
- Record sample locations using GPS

4.4.5.1 Identify Sampling Locations

TAPE soil samples will be collected as five-point composites with composite subsamples taken from similar use areas. Typical designs for outdoor soil sampling are shown graphically on Figure 3-2. It can be assumed that LA sources would have been distributed across an area, for example by tilling into a yard or garden. A minimum of one five-point composite soil sample will be collected at each Troy property, unless the property has no soil-covered areas (for example, all outdoor areas are paved). A five-point composite will also be collected from the specific use areas; however, the size and dimensions of the specific use area may require that less than five subsamples be collected for some specific use areas. At least one five-point composite sample will be collected from the yard area. In general, five-point composite samples will not cover more than approximately 5,000 square feet. A maximum of five, five-point composite samples will be collected at each property, but additional composite or grab samples may be collected at the discretion of the TAPE field team. The TAPE field team will use professional

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judgment to select the appropriate numbers of soil samples to collect at each property. In addition, the TAPE field team will collect all soil samples with the minimum amount of disturbance to the surface. Sod will be carefully removed and immediately replaced after sampling and care will be taken to collect soil samples without disturbing growing flowers and vegetables. To ensure consistency, all TAPE field teams will be provided the same training and guidelines, and training will include "brainstorming" potential property scenarios and discussing proposed sampling approaches.

4.4.5.2 Collect Soil Samples

Soil samples will be collected from (1) outdoor yards and open spaces, and (2) specific use areas at properties in the Troy OU. Figure 3-2 provides typical outdoor soil sampling designs for these two types of outdoor areas.

A typical Troy yard sample will be composed of a five-point composite soil sample collected from the 0 to 1 inch depth. As shown in Figure 3-2, the five individual sample points that will make up each composite sample will be located within a similar land use area, such as the back yard, front yard, or side yard. A minimum of one five-point composite sample will be collected from each Troy OU property with a yard. Additional five-point composite samples will be collected when the yards are larger than 5,000 square feet.

A typical open space sample will also be composed of a five-point composite soil sample, as shown on Figure 3-2, collected from the 0 to 1 inch depth. Typical spacing for the individual five-point locations are shown as approximately 30 feet, but this distance can be modified to best fit the land use area. Additional five-point composite samples will be collected for each open space area of approximately 5,000 square feet. The Tetra Tech field team will use professional judgment to select the appropriate number and type of soil samples to collect for each yard and open space. Not all open spaces may be sampled, depending on current and historical uses. To ensure consistency, all field teams will be provided the same training and guidelines, and training will include "brainstorming" potential property scenarios and discussing proposed sampling approaches.

Specific use areas in Troy include outdoor gardens, former gardens, flower-beds, play areas, gravel or dirt driveways, and other areas with potentially greater exposure or greater use of vermiculite amendments. Five-point composite soil samples will be collected from the 0 to 6 inch depth interval in specific use areas. Figure 3-2 presents typical layouts for a garden plot, flower bed, and undefined areas. Typical

sample spacing shown on Figure 3-2 is for 10 feet separation, but the distance can be modified to best fit the specific use area. The TAPE field teams will be provided training and guidelines for consistent sampling of specific use areas.

Disposable hand trowels will be used to collect approximately 500 grams of soil sample from the 0 to 1 inch or 0 to 6 inch soil interval at each subsample location for a total of approximately 2.5 kg of soil. If a small metal shovel is required to assist with sampling to 6 inches, the shovel will be thoroughly cleaned and decontaminated after each sample using procedures outlined in Section 5.1. Subsamples will be placed into one re-closable plastic bag and mixed. During sample collection and mixing, the field team will attempt to shield the soil samples from the wind to avoid potentially losing lighter fractions of the soil to the ambient air.

The initial re-closable plastic bag will be placed inside a second bag as a precaution. A pre-printed sample label will be affixed to the outside of the inner re-closable bag as well as the sample ID number written on the outside of the inner bag. The outer re-closable plastic bag will also be labeled and marked similarly using the pre-printed sample ID numbers. Soil samples will be labeled with a unique sample identification number "TT-XXXXX" where "TT" indicates a "Troy TAPE" sample. Chain-of-custody procedures will be followed as described in Section 5.5.2.

The TAPE field team will attempt to restore the land surface to its prior condition after sampling, but Tetra Tech will not be responsible for re-laying sod or replanting. For most sample locations, the small area can be replaced with soil from immediately surrounding the excavation and lightly tamped down. In addition, each TAPE field team will have some commercially-available potting soil or quality topsoil available to repair any small excavations that cannot be easily filled with nearby soil materials. It is not envisioned that sampling will require large-scale disturbance of yards, since the sample size required is small.

4.4.5.3 Record Sample Location on Troy Property Map and with GPS

The field team will mark each soil subsample location on the Troy property map with labeling to indicate the composite sample for which the subsample was collected. A backpack-mounted Trimble XRS-Pro GPS will be used to record the midpoint subsample location for each composite soil sample. The GPS location coordinates will be recorded on the GPS unit with a unique identification number that

corresponds with the sample point identification number "SP-XXXXXX." The GPS coordinates will also be recorded in the FSDS and field logbook for backup and verification of sample locations.

4.4.6 Photography

Each TAPE field team will have a camera for photo-documenting the conditions at a property, if the conditions are not readily described in writing or if, in the judgment of the field team, photographs may assist in development of a remedial action plan for that property. Permission from the property owner will be obtained before any photograph is taken, other than for photographs taken from the public right-of-way.

All photographs will be recorded in the field logbook and on the IFF, and on the property map using the following symbol to indicate the position where the photograph was taken and the direction it was taken (•→). No accurate distance scales will be used for landscape photographs, but general distances can be estimated by noting the location where the photograph was taken. All photographs will be taken using digital cameras and will be download the same day at the Troy Tetra Tech field office and saved.

Do we need a discussion of numbering/identification and the fact that the photos won't be printed until needed for clean up design work? The photo log is on the IFF.

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5.0 FIELD QUALITY CONTROL PROCEDURES

Section 5.0 describes the methods and procedures for decontamination, quality assurance samples, field documentation, handling investigation-derived wastes, and maintaining chain of custody of samples and records.

5.1 EQUIPMENT AND PERSONNEL DECONTAMINATION

Dust samples will be collected using laboratory-provided filter cassettes with a new cassette and template for each sample collected. The air pump will not require decontamination between samples as a matter of course because of its position behind the sample filter during sample collection. If the exterior of the air pump becomes visibly dusty, it will be wiped clean with a damp paper towel to avoid transferring dust from one location to another.

Disposable scoops and individual sample collection bags will be used for soil and building material sampling; therefore decontamination of the equipment that is in touch with the soil is not necessary. If a small metal shovel is required to assist with sampling to 6 inches in hard, compacted soils, the shovel will be thoroughly cleaned and decontaminated after each sample using a spray bottle with distilled water and paper towels.

Visible soil on hands or clothing will be removed by washing with soap and water. Additional personnel decontamination procedures, including requirements for decontamination zones, are described in Section 9.2 of the HASP (Appendix A). PPE will include disposable gloves, disposable protective outerwear, work boots, and respirators. The respirators will be cleaned and decontaminated as discussed in the HASP (Appendix A).

5.2 QUALITY ASSURANCE SAMPLES

Field blank dust samples will be collected at a frequency of one blank sample per 20 samples, or at 5 percent. Field blank dust samples will be collected at locations selected by the TAPE field team, and will be collected by attaching a cassette to the pump and pumping for 1 minute at the same rate as for dust sample collection. However, the cassette will not have a nozzle, and the end of the cassette will be exposed to indoor air at the selected sampling location, rather than passed over a surface of any kind. Data for the field blank dust samples will be evaluated to assess whether a potential exists for airborne

asbestos to cause analytical detections of asbestos in dust, or for cross-contamination to occur during sampling.

Dust lot blank samples will also be submitted to the laboratory for each lot or batch of cassettes received from the laboratory. Data for dust lot blank samples will be used to evaluate whether cartridges were received asbestos-free from the laboratory. Tetra Tech will not use a cassette from a given lot until the dust lot blank results confirm the cartridges are asbestos-free.

Soil field equipment blanks will be collected at a rate of one per calendar week (Monday through Sunday) of sampling per field team. Field equipment blanks will be collected by placing silica sand (that is `asbestos-free as analyzed by polarized light microscopy [PLM]) in a re-closable plastic bag, mixing it with a disposable trowel, and submitted for analysis following the same PLM methods. Data from field equipment blank samples will be used to evaluate whether the disposable equipment is asbestos-free.

Field equipment blanks are sent to the EMSL Laboratory located in Libby for analysis by method PLM-9002. In addition, during the initial portion of the field work, at least two dust samples per team will be sent to the EMSL Laboratory for rapid analysis. These samples will confirm the field team members are using proper dust sampling techniques.

Soil field duplicate samples will be collected at a frequency of one sample per 20 composite soil samples or a rate of 5 percent. Field duplicate samples will be collected as samples collocated in the same land use area (yard or landscaped area, for example) and will contain the same number of subsamples (typically five), but will be collected from different subsample locations. Data for soil field duplicates will be used to evaluate the potential variability in LA concentrations in a specific land use area. These data will not be used to evaluate precision in sampling or analytical techniques.

All quality assurance samples will be submitted “blind” (labeled as a collected sample) to the laboratory.

5.3 FIELD DOCUMENTATION

Example field forms (interview forms, IFFs, and FSDS) are provided in Appendix E. Before the TAPE field activities begin, all members of the Tetra Tech field team will receive the same training on implementation of this Work Plan in general and on use of these forms in particular. Property owner interviews, property inspections, and sample collections will be conducted using these forms to ensure

consistency between properties and between TAPE field teams. Use of these forms will also allow compilation of TAPE-derived data into the Libby V2 database (see Section 5.5).

Any additional information that is not recorded on field forms will be recorded in the TAPE field logbooks. Each field team will maintain a field logbook for recording the date and time of each property inspection, the names of the people who allowed property access and completed the interview, the property ID and building ID numbers, the number and type of samples collected at the property including sample ID numbers and FSDS numbers, and any other pertinent information. A new page will be started in the field logbook for each property. The field logbook will serve as an independent (backup) record for all activities conducted and samples collected at a property, in the event that IFFs or FSDSs are lost or damaged. The field logbook will also be used to record additional observations of the field team that relate to potential remedial action at a property, such as locations, quantities and types of suspect asbestos-containing material that is not VCI or LA, and access limitations that were not noted on the IFF.

Information will also be recorded on the individual property maps by sketching directly onto the property maps, which will have an aerial photograph base. Property map sketches will show the locations of any observed VCI and LA-containing rock, primary and secondary buildings and the main entrance of each building, and the outdoor sample (including subsample) locations.

5.4 CONTAINMENT AND DISPOSAL OF INVESTIGATION-DERIVED WASTE

Investigation-derived waste will include used wet wipes, wet paper towels, disposable gloves, used respirator cartridges, used plastic tubing, decontamination water, disposable protective outerwear, plastic floor coverings, and other minimal waste. It is possible, but not likely, that these investigation-derived waste materials may contain some asbestos. Therefore, all investigation-derived waste will be double-bagged in appropriate asbestos bags, labeled with asbestos labels, and stored in approved containment at the Tetra Tech field office until it can be properly disposed of at an approved landfill (Lincoln County outside of Libby). Non-sampling waste generated by the TAPE field teams, such as food containers and waste paper, will be separately bagged and disposed of as solid waste at a solid waste landfill.

5.5 RECORD KEEPING AND CHAIN OF CUSTODY

At the end of each day, or more often if required, the TAPE field teams will return to the Troy Tetra Tech field office to transfer the dust, building material, soil, and QC samples; the IFFs, interview forms, and

FSDSs; and copies of the appropriate logbook pages to the Tetra Tech sample coordinator (or the coordinator's designee). All verbal interview forms, IFFs, and FSDSs will be compiled at the Troy field office, photocopied, and the original copies forwarded to the Tetra Tech office in Helena, Montana with a duplicate set of copies forwarded to Volpe on a weekly basis. An individual file will be maintained for each property inspected. Photocopies of all field forms and appropriate logbook pages in each individual property file will be maintained in the Troy field office for the duration of the TAPE project so that information is available if questions arise. The original forms will be stored in the Tetra Tech office in Helena, Montana, for the duration of the sampling, inspection, and reporting phases of the TAPE project. The original forms will be transferred to DEQ at the end of the TAPE project. Copies of the field forms and field logbook will be available on request at any time during the TAPE project to DEQ, EPA, or to the Troy property owners.

After the field forms have been received from the TAPE field teams, the Tetra Tech Field Data Coordinator will check all paperwork and corresponding location, building, and sample ID numbers for accuracy. The Tetra Tech Field Data Coordinator will then transfer the hard copies of the field forms and the associated dust, building material, and soil samples collected for the Troy properties to the CDM Troy Sample Coordinator. The CDM Troy Sample Coordinator will manually enter the information into the eLastic application for ultimate transfer to the Libby V2 database, pursuant to the eLastic data entry SOP (Appendix B). The CDM Troy Sample Coordinator will conduct a 100 percent data check to ensure that all information has been entered correctly. When the data check is complete, the CDM Troy Sample Coordinator will export the data to the Libby V2 database, via Volpe.

Until samples have been transferred to the CDM Troy Sample Coordinator, all TAPE samples will be held by Tetra Tech. Samples may be stored in locked vehicles or in a secured (locked) area of the Troy Tetra Tech field office. All TAPE samples collected from the Troy properties, including QC samples, will be transferred to the CDM Troy Sample Coordinator at least on a weekly basis. The CDM Troy Sample Coordinator will provide Tetra Tech with a copy of a chain of custody, pursuant to the electronic chain-of-custody SOP (Appendix B). The CDM Troy Sample Coordinator will then transfer the samples to the laboratory for preparation and analysis.

Digital photographs will be downloaded daily to a computer at the Tetra Tech Troy field office. Photographs will be downloaded and labeled using a standard labeling procedure that is based on property and building ID numbers. Individual photographs will not be routinely printed from the Troy field office.

6.0 DATA MANAGEMENT

Data management during the inspection and sampling will be under the supervision of the TAPE Field Data Coordinator in the Troy field office. At the conclusion of inspection and sampling, that responsibility will pass to the TAPE project manager.

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6.1 DATA REQUISITION

The laboratory will report all analytical data to Volpe and Volpe will oversee integration of that data into the Libby V2 database. Tetra Tech and DEQ will obtain sampling data from the Libby V2 database by requesting that data from Volpe (through EPA) on a standard information request form. Tetra Tech will request the following information from the Libby V2 database for each sample, including QC samples, collected during the TAPE project:

- Sample location
- Sample name
- Sample date
- Sample results
- Identification numbers, dates, and results for laboratory quality control samples

Volpe will provide this information (through EPA) in the standard Libby V2 data report format. All other information necessary for reporting purposes will be obtained from Tetra Tech internal files (copies of IFFs, FSDSs, property sketches, and logbooks).

6.2 DATA REPORTING

Data from the Libby V2 database will be obtained through a geographic information system interface software (ArcView). This interface will provide maps showing all TAPE sample locations. Dust and soil sampling results will be provided from the Libby V2 database in tabulated form, as Microsoft Access files. Tetra Tech will prepare a TAPE project report that describes the activities conducted, the results of the property inspections, and the results of the sampling, evaluates data quality, and recommends follow-up actions. The TAPE project report will include maps for each property where asbestos in soil or in dust exceeded screening levels. TAPE project maps will show sample locations and results for the property and delineate the areal extent of asbestos.

7.0 QA/QC PROCEDURES

The TAPE quality objectives, QC checks and samples, and audits completed for the TAPE project are described in the sections below. Field quality control procedures are described in Section 5.0 above.

7.1 QA/QC OBJECTIVES

The quality objectives of the TAPE project are to obtain 100 percent usable and accurate data. These data will be achieved through inspection and sampling using standardized field forms and procedures, auditing field operations, observing chain of custody procedures, and analyzing field quality control samples and laboratory quality control samples. The DQOs are further discussed in Section 3.0 of this Work Plan.

7.2 INTERNAL QC CHECKS

When laboratory analytical data are received, Volpe will conduct a thorough quality review of that data. Volpe will review data from both laboratory QC samples described below and field QC samples described in Section 5.2. Standard protocols exist for validation of soil samples analyzed by PLM for asbestos and will be followed. Standard protocols do not exist for validation of dust samples for asbestos; however, EPA and their contractors will follow the QC review procedures for dust data established at the Libby Asbestos Superfund Site. EPA and their contractors will prepare validation and review packages for all TAPE data and will transmit the reports to Tetra Tech to be included in the TAPE project report.

Dust and soil samples will be analyzed by one of the contract laboratories following Libby Asbestos Superfund Site protocols, including EPA's most recent protocols relating to QA/QC for the Libby Asbestos Superfund Site. As such, the QA/QC protocols followed by the laboratories are not within Tetra Tech's immediate control.

Laboratory QA/QC samples and standard protocols that the contract laboratory will perform for routine analysis will include appropriate laboratory procedures for the analyses of the following sample types:

- Preparation Duplicate Samples
- Preparation Laboratory Equipment Blanks (grinding and other equipment)
- Method Blank Samples
- Matrix Spike/Matrix Spike Duplicates
- Laboratory Control Samples/Laboratory Control Duplicates

- Standard Reference Material
- Surrogates

Volpe will enter data into the Libby V2 project database with a 100 percent QC of the data.

7.3 AUDITS, CORRECTIVE ACTIONS, AND QA REPORTS

Field audits will be an integral part of Tetra Tech's field operations for the duration of the TAPE project. Field audits and corrective actions will be the responsibility of the Tetra Tech QA/QC manager. (See Section 2.0 and Table 2-1 for designated key project personnel.) The TAPE project report will include a discussion of data quality that will include a summary of field audit results. Copies of field audit forms will be provided as an appendix to the TAPE project report.

7.3.1 Field Inspections and Sampling Procedures Audits

The Tetra Tech QA/QC manager will be responsible for audits of TAPE field inspections and sampling procedures. Audits will be conducted daily for the first 5 days of inspection and sampling and at least biweekly for the duration of the TAPE. Audits will consist of the QA/QC manager or his designee attending a Troy property inspection and sampling event and observing the TAPE field team's activities. The field team will not be notified of the audit. The auditor will compare the field team's activities with the protocols provided in this Work Plan and the attached SOPs and evaluate compliance with the protocols using the audit form provided in Appendix E. After the audit, the auditor will provide the completed audit form to the DEQ and Tetra Tech project managers.

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7.3.2 Corrective Action Procedures

The QA/QC auditor may use his or her discretion to provide immediate verbal feedback to the TAPE field team if necessary to ensure that deficiencies are fixed as quickly as possible. The Tetra Tech field team leader and QA/QC manager will review the report with the TAPE field team within 48 hours of the audit to correct any deviations or deficiencies. If any deviations or deficiencies were noted, the field team will be audited again within 1 week of the original audit to ensure that any deficiencies have been fixed.

If gross deficiencies are noted, the Tetra Tech QA/QC manager will determine whether re-inspection or re-sampling of any Troy properties is required. Re-inspection or re-sampling will be required only if the

TAPE field team failed to correctly identify VCI during inspection, collected samples incorrectly, or collected a grossly inadequate number of samples.

7.3.3 Laboratory Audits

The EPA contract laboratories used to analyze the Troy project samples will be required to provide proof of current certifications. Examples of certifications include the following: American Industrial Hygiene Association and the National Voluntary Laboratory Accreditation Program. The verification of laboratory certifications and QC controls will be under the jurisdiction of Volpe or EPA. These agencies are responsible for conducting the laboratory audits if required.

REFERENCES

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APPENDIX A

SITE-SPECIFIC HEALTH AND SAFETY PLAN
TROY ASBESTOS PROPERTY EVALUATION

APPENDIX B

STANDARD OPERATING PROCEDURES (SOPs)
TROY ASBESTOS PROPERTY EVALUATION

Tetra Tech - Troy

- Tetra Tech TAPE FSDS and IFF Completion Guidance, Version 01
- Tetra Tech TAPE Soil Sampling Guidance, Version 01

CDM/EPA – Libby

- CDM-Libby-03 Completion of Field Sampling Data Sheets
- CDM-Libby-04 Completion of Inspection Field Forms
- CDM-Libby-05 Site-Specific Standard Operating Procedure for Soil Sample Collection
- CDM-Libby-07 CSF eLASTIC Module

American Society for Testing and Materials (ASTM)

- ASTM D5755-95

Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Building Number Concentrations

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APPENDIX C

EQUIPMENT/SUPPLIES LIST
TROY ASBESTOS PROPERTY EVALUATION

APPENDIX D

SAMPLE COVER LETTER, ACCESS AGREEMENT, AND SAMPLE RECEIPT
TROY ASBESTOS PROPERTY EVALUATION

APPENDIX E

FIELD FORMS
TROY ASBESTOS PROPERTY EVALUATION

Sheet Number ____of____

TROY ASBESTOS PROPERTY EVALUATION
FIELD SAMPLE DATA SHEET
Dust Sampling

Physical Address: _____
Property Identification Number: AD - _____
Building Identification Number: BD - _____
Owner: _____
Building Description: Primary Garage Barn Shed Other _____
Building Use: Residential School Commercial Other_____
Date: _____
Field Logbook No.: _____ Pages No.: _____
Sampling Team: _____

Data Item	Sample 1	Sample 2	Sample 3
Sample ID (TT)			
Location Description (room)			
Category	FS_____ FD_____ Blank_____	FS_____ FD_____ Blank_____	FS_____ FD_____ Blank_____
Matrix	Building Vehicle Other _____	Building Vehicle Other _____	Building Vehicle Other _____
Sample Area (cm^2)	300 Other _____	300 Other _____	300 Other _____
Filter Diameter	.45um .37 um	.45um .37 um	.45um .37 um
Pore Size	TEM PCM	TEM PCM	TEM PCM
Flow Meter Type			
Flow Meter ID No.			
Pump ID No.			
Start Time			
Start Flow (l/min)			
Stop Time			
Stop Flow (l/min)			
Pump Fault?	No Yes	No Yes	No Yes
Map Location			
Field Comments			
	Entered_____ Validated _____	Entered_____ Validated _____	Entered_____ Validated _____

Sheet Number ____of____

TROY ASBESTOS PROPERTY EVALUATION
FIELD SAMPLE DATA SHEET
Dust Sampling

Physical Address: _____
Property Identification Number: AD - _____
Building Identification Number: BD - _____
Owner: _____
Building Description: Primary Garage Barn Shed Other _____
Building Use: Residential School Commercial Other_____
Date: _____
Field Logbook No.: _____ Pages No.: _____
Sampling Team: _____

Data Item	Sample 1	Sample 2	Sample 3
Sample ID (TT)			
Location Description (room)			
Category	FS_____ FD_____ Blank_____	FS_____ FD_____ Blank_____	FS_____ FD_____ Blank_____
Matrix	Building Vehicle Other _____	Building Vehicle Other _____	Building Vehicle Other _____
Sample Area (cm^2)	300 Other _____	300 Other _____	300 Other _____
Filter Diameter	.45um .37 um	.45um .37 um	.45um .37 um
Pore Size	TEM PCM	TEM PCM	TEM PCM
Flow Meter Type			
Flow Meter ID No.			
Pump ID No.			
Start Time			
Start Flow (l/min)			
Stop Time			
Stop Flow (l/min)			
Pump Fault?	No Yes	No Yes	No Yes
Map Location			
Field Comments			
	Entered_____ Validated _____	Entered_____ Validated _____	Entered_____ Validated _____

TROY ASBESTOS PROPERTY EVALUATION
FIELD EQUIPMENT AND SUPPLIES

Rental equipment:
7 battery-operated low-flow air pumps (5 required plus 2 for backup)
Calibration for pumps (Dry-Cal?)
6 Trimble pro-XRS GPS units (5 required plus 1 for backup)
6 digital cameras
6 Phones/radios (one for field office, one for each team)
Photocopier
Vehicles

Purchase/From Supplies:
2 laptop computers

Inspection:
10 clipboards
6 x 50-foot tape measures
Palette knives, etc. (for looking under insulation)
5 non-conductive stepladders (for attic, barn inspections)
Scale bars for photographs
Field log books
5 HEPA vacuum

Sampling:
Pocket knives
Re-closable plastic bags, various sizes
Duct tape
Wet wipes
Waterproof permanent markers
Soil trowels and scoops (disposable)
Small shovels
Sample labels
Silica sand (asbestos-free) for soil field blanks
Secure shipment containers
Trash bags
Plastic floor covering

PPE:
Respirator for each asbestos inspector
Replacement particulate respirator cartridges
Vinyl/nitrile gloves, various sizes
Disposable protective outerwear

Decon:
Paper towels
Bristle brushes
Water spray bottles
5-gallon buckets
Surfactant (Alconox)
Deionized water

Lab-supplied:
Microvacuum dust sampling cassettes
¼-inch diameter plastic tubing, cut at 45° angle
100cm^2 templates
Sample shipment security seals

Field Forms:
IFFs
FSDSs (Dust and Soil-Like Materials)
Interview forms
Field audit forms

TROY ASBESTOS PROPERTY EVALUATION
FIELD EQUIPMENT AND SUPPLIES

Rental equipment:
7 battery-operated low-flow air pumps (5 required plus 2 for backup)
Calibration for pumps (Dry-Cal?)
6 Trimble pro-XRS GPS units (5 required plus 1 for backup)
6 digital cameras
6 Phones/radios (one for field office, one for each team)
Photocopier
Vehicles

Purchase/From Supplies:
2 laptop computers

Inspection:
10 clipboards
6 x 50-foot tape measures
Palette knives, etc. (for looking under insulation)
5 non-conductive stepladders (for attic, barn inspections)
Scale bars for photographs
Field log books
5 HEPA vacuums

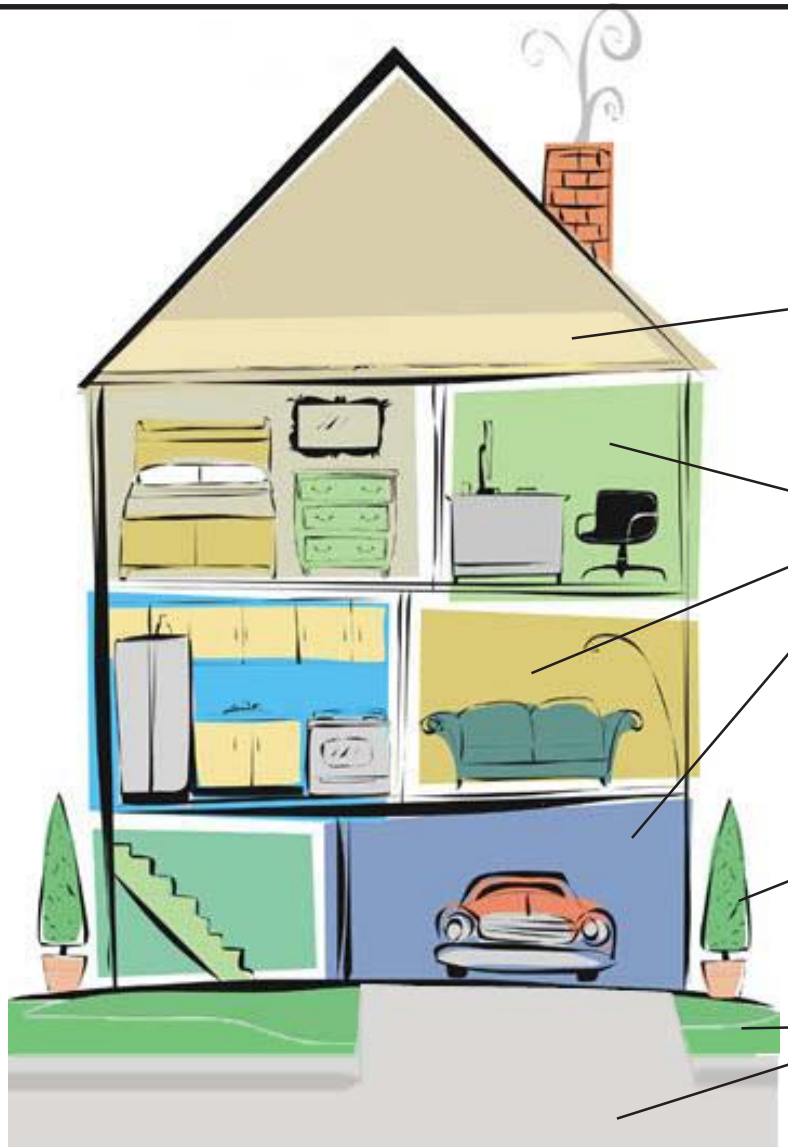
Sampling:
Pocket knives
Re-closable plastic bags, various sizes
Duct tape
Wet wipes
Waterproof permanent markers
Soil trowels and scoops (disposable)
Small shovels
Sample labels
Silica sand (asbestos-free) for soil field blanks
Secure shipment containers
Trash bags
Plastic floor covering

PPE:
Respirator for each asbestos inspector
Replacement particulate respirator cartridges
Vinyl/nitrile gloves, various sizes
Disposable protective outerwear

Decon:
Paper towels
Bristle brushes
Water spray bottles
5-gallon buckets
Surfactant (Alconox)
Deionized water

Lab-supplied:
Microvacuum dust sampling cassettes
¼-inch diameter plastic tubing, cut at 45^{o} angle
$100cm^2$ templates
Sample shipment security seals

Field Forms:
IFFs
FSDSs (Dust and Soil-Like Materials)
Interview forms
Field audit forms



SAMPLE COLLECTION

BUILDING INTERIOR

Inspect Building Attic for VCI → Complete field form
No sample collected in attic

Inspect Each Building Level for VCI → If migrating VCI visible, sample room as SSVR

Inspect Each Building Level for VCI → Collect dust samples from each building level

PROPERTY EXTERIOR

Specific Use Areas (gardens, flower beds, play areas; any areas with potentially greater exposure or greater use of amendments) → Inspect **each** Area and Collect Composite Soil Sample from **each** Area

Yards and Open Space → Inspect **all** Areas and Collect Composite Soil Sample from **each** Discrete Area of approximately 5,000 square feet.

NOTES:
VCI = Vermiculite Containing Insulation
SSVR = Small Scale Vermiculite Removal

TROY ASBESTOS PROPERTY EVALUATION
TROY, MONTANA

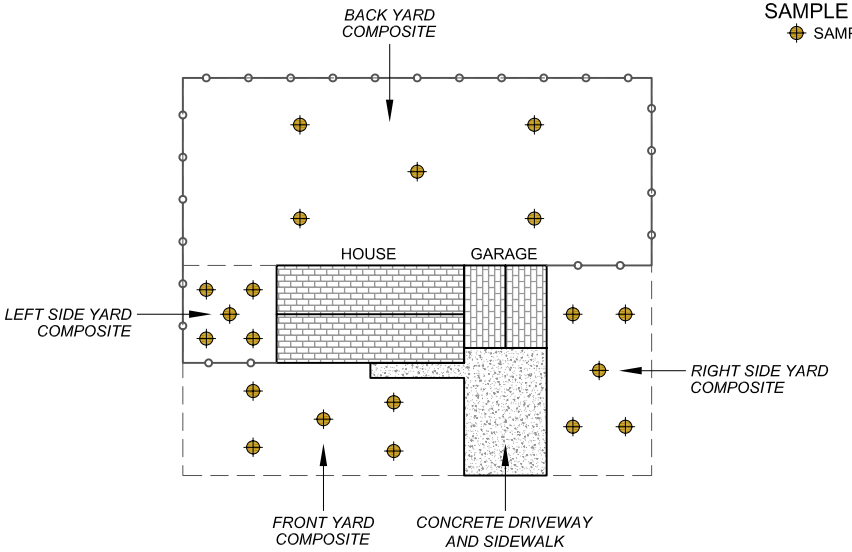
FIGURE 3-1
Tape Inputs

Tetra Tech EM Inc.

YARDS AND OPEN AREAS

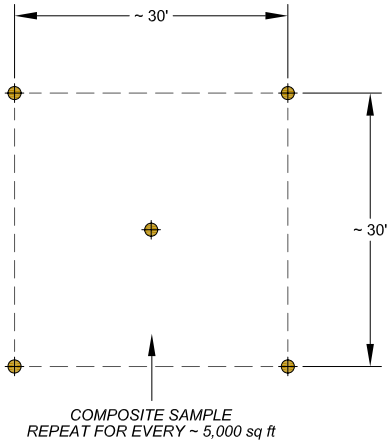
SAMPLE COLLECTION DETAILS

⊕ SAMPLE COLLECTION LOCATION



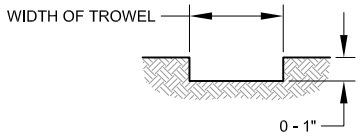
PLAN VIEW

(WITH DEFINED AREAS AND BOUNDARIES)



PLAN VIEW

(WITHOUT DEFINED AREAS AND BOUNDARIES)



SAMPLE COLLECTION SECTION

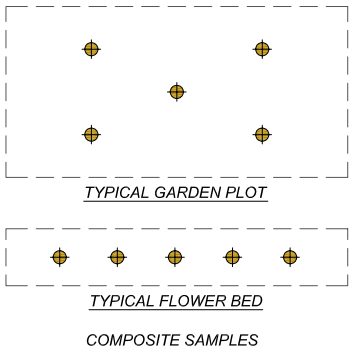
(YARD AND OPEN AREAS)

SPECIFIC USE AREAS

(GARDENS, FORMER GARDENS, FLOWER BEDS, PLAY AREAS)

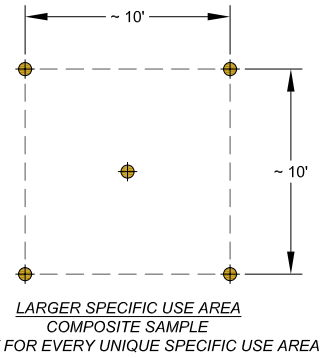
SAMPLE COLLECTION DETAILS

⊕ SAMPLE COLLECTION LOCATION



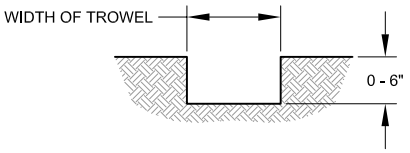
PLAN VIEW

(WITH DEFINED AREAS AND BOUNDARIES)



PLAN VIEW

(WITHOUT DEFINED AREAS AND BOUNDARIES)



SAMPLE COLLECTION SECTION

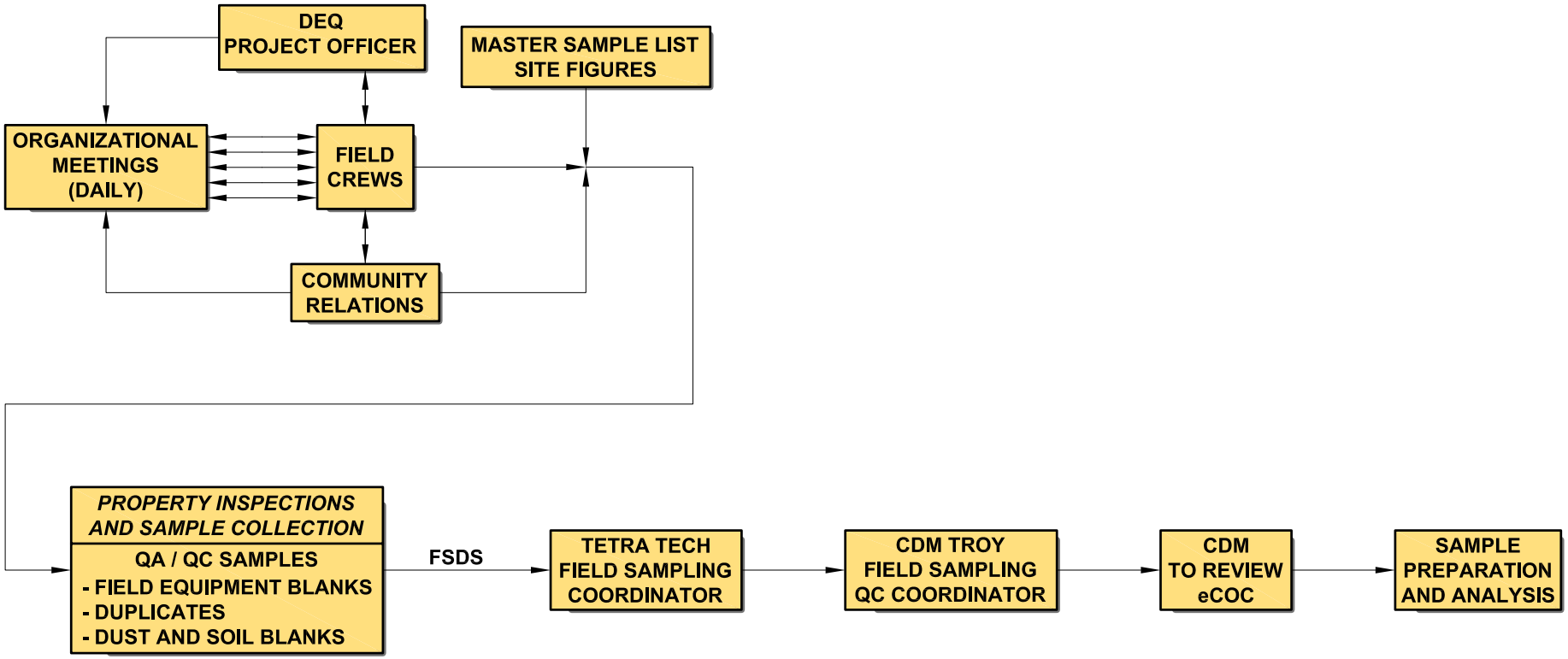
(SPECIFIC USE AREAS)

TROY ASBESTOS PROPERTY EVALUATION
TROY, MONTANA

FIGURE 3-2
TAPE Outdoor Soil Sampling Design

Tetra Tech EM Inc.

FIG_3-2_Soil Sampling Design.dwg - DWH - 03/13/2006 - S1176-41-TROYWP



DEQ - Montana Department of Environmental Quality
eCOC - Electronic Chain of Custody
FSDS - Field Sample Data Sheet
QA - Quality Assurance
QC - Quality Control

TROY ASBESTOS PROPERTY EVALUATION
TROY, MONTANA

FIGURE 3-3
TAPE Inspection and Sampling Process Diagram

Tetra Tech EM Inc.

FIG_3-3_Sampling Process Diagram.dwg - DWH - 02/23/2006 - S1176-41-TROYWP

Interview for Residents/Employees of Troy, Montana

Date_____ Time:_____ Interviewers: _____

_____

Physical Address of Property: _____

Property Identification Number: AD-__ __ __ __ __ __

	Name	Mail Address	Physical Address	Contact Phone
Property Owner				
Property Occupant				

If you need more room for responses, please continue writing on the back of each page, with the question number clearly identified.

1. Primary contact name and phone number (for follow-up questions/concerns):

   _____

2. Names and approximate age of all residents of the house or workers in the commercial establishment – enter information into table below (indicate with an * all members that participated in the interview). Comments – indicate if seasonal resident/employee, temporary resident/employee, any other pertinent info offered.

Name	Age	Comments

Interview for Residents/Employees of Troy, Montana

3. How long has your family been living/business operational in Troy?
   _____ years
4. How long has your family been living/in business at your current address?
   _____ years
5. Do you have outdoor pets? Yes No If yes, do they come inside at all?

   _____

6. If you have asbestos-related health concerns, where do you go for information?

   _____

7. Do you have any specific asbestos-related health concerns you would like to share? If yes please describe. ** There is no requirement to provide personal/medical information and no guarantee it will remain confidential**

   _____

   _____

8. Did anyone in your family/employment work at the vermiculite mine or the vermiculite processing operations? If so, please provide job title/description of duties, and approximate dates of employment. If no, skip to Question #11.

   _____

   _____

9. Typically after a day of work, did family members working in the vermiculite mining or processing operations (circle one):

   a) change clothes at work, or b) wear their work clothes home?

10. How did family members most frequently get to and from the vermiculite work site? (circle one):

    a) personal vehicle, b) ride from coworker, c) bus, d) other.

11. To the best of your knowledge, was vermiculite from the mine used in or around your home? Yes No

    If no, skip to Question #18.

    If so, was the vermiculite used in/around your home purchased from a store? Yes No
    If no, where did you get it from?_____

12. Was the vermiculite used for insulation? Yes No

    If yes, please describe locations: _____

    _____

13. If yes, is dust from the vermiculite insulation often visible in any of the living areas of the house? Yes No

14. Was the vermiculite used for (circle all applicable):

    a) gardens, b) planting, c) greenhouse?

15. Were there other ways the vermiculite was used? Yes No If yes please describe:

_____

_____

16. What year was your house built? _____

17. Are you aware of any asbestos-containing products other than Libby vermiculite in your home - such as floor tiles, pipe insulation, siding? Yes No

    If yes, please describe: _____

    _____

18. Besides work, did any of the family participate in any activities that bring them frequently into contact with the mine/processing facilities/vermiculite? Yes No

    If so please describe: _____

    _____

    Can you think of any way vermiculite might have gotten into your home now or in the past (i.e. on clothing?) Yes No
    If so please describe: _____

    Do you know of any areas around Troy where vermiculite from the mine has been placed? Yes No If so, please list: _____

    _____

19. Is there anything else you would like to say about the mine?

    _____

    _____

20. Is there anything you'd like more information about?

    _____

    _____

21. What do you think is the best way to communicate with people in Troy?

    a) newspaper, b) newsletter, c) radio, d) civic organizations,
    e) meetings, f) other (please describe: _____)

    Any other input regarding public outreach, meetings? _____

    _____

22. Can you think of any other people we should talk with? Yes No

    If yes, who: _____

    _____

Interview for Residents/Employees of Troy, Montana

Date_____ Time:_____ Interviewers: _____

_____

Physical Address of Property: _____

Property Identification Number: AD-_____

	Name	Mail Address	Physical Address	Contact Phone
Property Owner				
Property Occupant				

If you need more room for responses, please continue writing on the back of each page, with the question number clearly identified.

1. Primary contact name and phone number (for follow-up questions/concerns):

   _____

2. Names and approximate age of all residents of the house or workers in the commercial establishment – enter information into table below (indicate with an * all members that participated in the interview). Comments – indicate if seasonal resident/employee, temporary resident/employee, any other pertinent info offered.

Name	Age	Comments

Interview for Residents/Employees of Troy, Montana

3. How long has your family been living/business operational in Troy?
   _____ years
4. How long has your family been living/in business at your current address?
   _____ years
5. Do you have outdoor pets? Yes No If yes, do they come inside at all?

   _____

6. If you have asbestos-related health concerns, where do you go for information?

   _____

7. Do you have any specific asbestos-related health concerns you would like to share? If yes please describe. ** There is no requirement to provide personal/medical information and no guarantee it will remain confidential**

   _____

   _____

8. Did anyone in your family/employment work at the vermiculite mine or the vermiculite processing operations? If so, please provide job title/description of duties, and approximate dates of employment. If no, skip to Question #11.

   _____

   _____

9. Typically after a day of work, did family members working in the vermiculite mining or processing operations (circle one):

   a) change clothes at work, or b) wear their work clothes home?

10. How did family members most frequently get to and from the vermiculite work site? (circle one):

    a) personal vehicle, b) ride from coworker, c) bus, d) other.

11. To the best of your knowledge, was vermiculite from the mine used in or around your home? Yes No

    If no, skip to Question #16.

    If so, was the vermiculite used in/around your home purchased from a store? Yes No
    If no, where did you get it from?_____

12. Was the vermiculite used for insulation? Yes No

    If yes, please describe locations: _____

    _____

13. If yes, is dust from the vermiculite insulation often visible in any of the living areas of the house? Yes No

14. Was the vermiculite used for (circle all applicable):

    a) gardens, b) planting, c) greenhouse?

15. Were there other ways the vermiculite was used? Yes No If yes please describe:

_____

_____

16. What year was your house built? _____

17. Are you aware of any asbestos-containing products other than Libby vermiculite in your home - such as floor tiles, pipe insulation, siding? Yes No

    If yes, please describe: _____

    _____

18. Besides work, did any of the family participate in any activities that bring them frequently into contact with the mine/processing facilities/vermiculite? Yes No

    If so please describe: _____

    _____

    Can you think of any way vermiculite might have gotten into your home now or in the past (i.e. on clothing?) Yes No
    If so please describe: _____

    Do you know of any areas around Troy where vermiculite from the mine has been placed? Yes No If so, please list: _____

    _____

19. Is there anything else you would like to say about the mine?

    _____

    _____

20. Is there anything you'd like more information about?

    _____

    _____

21. What do you think is the best way to communicate with people in Troy?

    a) newspaper, b) newsletter, c) radio, d) civic organizations,
    e) meetings, f) other (please describe: _____)

    Any other input regarding public outreach, meetings? _____

    _____

22. Can you think of any other people we should talk with? Yes No

    If yes, who: _____

    _____

TROY ASBESTOS PROPERTY EVALUATION
FIELD SAMPLE DATA SHEET
Soil-Like Materials

Physical Address: _____

Property Identification Number: AD - _____

Owner: _____

Land Use: Residential School Commercial Mining Logging
Roadway Other_____

Date: _____

Field Logbook No.: _____ Pages No.: _____

Sampling Team: _____

Data Item	Sample 1	Sample 2	Sample 3
Sample ID (TT)			
GPS Recorded?	No Yes	No Yes	No Yes
Sample Point ID (SP)			
Category	FS_____ FD_____	FS_____ FD_____	FS_____ FD_____
Matrix	Surface Soil Sod Fill Mining Waste Other _____	Surface Soil Sod Fill Mining Waste Other _____	Surface Soil Sod Fill Mining Waste Other _____
Location Description	Yard Garden Planter Play Area Driveway Other _____	Yard Garden Planter Play Area Driveway Other _____	Yard Garden Planter Play Area Driveway Other _____
Type	Grab Composite - # subsamples: _____	Grab Composite - # subsamples: _____	Grab Composite - # subsamples: _____
Sample Time			
Top Depth (in.)			
Bottom Depth (in.)			
Map Location			
Field Comments			
	Entered_____ Validated _____	Entered_____ Validated _____	Entered_____ Validated _____

TROY ASBESTOS PROPERTY EVALUATION
FIELD SAMPLE DATA SHEET
Soil-Like Materials

Physical Address: _____

Property Identification Number: AD - _____

Owner: _____

Land Use: Residential School Commercial Mining Logging
Roadway Other_____

Date: _____

Field Logbook No.: _____ Pages No.: _____

Sampling Team: _____

Data Item	Sample 1	Sample 2	Sample 3
Sample ID (TT)			
GPS Recorded?	No Yes	No Yes	No Yes
Sample Point ID (SP)			
Category	FS_____ FD_____	FS_____ FD_____	FS_____ FD_____
Matrix	Surface Soil Sod Fill Mining Waste Other _____	Surface Soil Sod Fill Mining Waste Other _____	Surface Soil Sod Fill Mining Waste Other _____
Location Description	Yard Garden Planter Play Area Driveway Other _____	Yard Garden Planter Play Area Driveway Other _____	Yard Garden Planter Play Area Driveway Other _____
Type	Grab Composite - # subsamples: _____	Grab Composite - # subsamples: _____	Grab Composite - # subsamples: _____
Sample Time			
Top Depth (in.)			
Bottom Depth (in.)			
Map Location			
Field Comments			
	Entered_____ Validated _____	Entered_____ Validated _____	Entered_____ Validated _____

TROY ASBESTOS PROPERTY EVALUATION (TAPE)

PROJECT-SPECIFIC GUIDANCE

TAPE FSDS and IFF Completion Guidance
Version 01

Prepared for:
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
P.O. Box 200901
Helena, MT 59620-0901

Prepared by:
TETRA TECH EM INC.
7 West 6th Avenue
Helena, MT 59601

Date:
March 13, 2006

1.0 FIELD SAMPLE DATA SHEET (FSDS) COMPLETION GUIDANCE

A field sample data sheet (FSDS) must be completed for each Troy, Montana property inspected during the Troy Asbestos Property Evaluation (TAPE) field project using the following guidance. Separate FSDS forms must be completed for Soil-Like Materials sampling and for Dust sampling.

1.1 FIELD SAMPLE DATA SHEET – SOIL-LIKE MATERIALS

1.1.1 Header Section of the FSDS

Sheet Number ____ of ____: Completed by sample field team to ensure multiple pages stay together when more than one page is needed.

Physical Address: (As it appears on the property IFF). The physical address of the property being sampled. Addresses are to be entered in the following format:
Street number – Direction – Street Name – Street Abbreviation

Where:

Street number = the number of the street address
Direction = the abbreviation of the street direction (N, S, E, or W), when applicable
Street name = correct spelling of the street name
Street abbreviation = when applicable

Road – Rd
Avenue – Ave
Street – St
Circle – Cr
Place – Pl
Boulevard – Blvd
Highway - Hwy

Examples: 510 N Mineral Ave
607 N Michigan Ave
521 Pipe Creek Rd

Property Identification Number: AD-☐☐☐☐☐☐
The AD-Number is provided by the TAPE field office coordinator and is a unique six-digit number for each Troy property.

Owner: (As it appears on the property IFF). The name of the property owner (not necessarily the current occupant).

Land Use: Description of land use for the property being sampled (circle one of the uses provided or write in description for others.

Date: Date samples are collected, in the form MM/DD/YY.

Field Logbook No.: The logbook number being used to record information specific to the samples on the FSDS.

Page No.: Page numbers in logbook with information for samples recorded on the FSDS.

Sampling Team: The names and company affiliation of sampling team.

1.1.2 Main Section of the FSDS

The following information items are provided in the Main Section of the FSDS. If more than 3 soil-like material samples are collected at a Troy property, an additional FSDS page must be completed.

Sample ID (TT): Each sample identification (ID) number is a unique five-digit number provided to the field team by the TAPE field office coordinator. Pre-printed, self-adhesive Sample ID numbers will be provided to the TAPE field teams in triplicate for labeling the FSDS column. the sample bag, and the field logbook page. Sample ID numbers for the TAPE field project are in the form TT- # # # # #.

GPS Recorded? Circle the right choice for whether the location was surveyed using global positioning survey (GPS).

Sample Point ID: A unique sample point number that will be referenced to the global positioning system (GPS) coordinates for the soil-like material sample point location in the form SP- # # # # #. A set of available numbers is assigned to each sampling team by the TAPE field office coordinator.

Category: FS = field sample or FD = field duplicate.

Matrix Type: The samples collected for the TAPE field project will mostly be surface soil samples (0 to 1 or 0 to 6 inches). If the sample is not a surface soil sample, circle one of the options provided (Sod, Fill, Mining Waste) or provide the type on the Other blank line.

Location Description: Describe the location where the soil-like material sample is collected. Circle one of the options provided (Yard, Garden, Planter, Play Area, Driveway) or provide a description on the Other blank line.

Type: Indicate the type of sample collected, grab or composite. If the sample is a composite sample, the number of sub-samples must be provided.

Sample Time: The time of sample collection, in military time.

Top Depth: Top depth of sample in inches below the ground surface.

Bottom Depth: Bottom depth of sample in inches below the ground surface.

Map Location: Provide the map number used to record the sample locations.

Field Comments: Record any information specific to that particular sample. If vermiculite is present, this must be noted in the field comments section.

Entered: Completed by Volpe personnel at time of data entry.

Validated: Completed by Volpe personnel at time of data entry check.

1.2 FIELD SAMPLE DATA SHEET – DUST SAMPLING

1.2.1 Header Section of the FSDS

Sheet Number ____ of ____: Completed by sample field team to ensure multiple pages stay together when more than one page is needed.

Physical Address: (As it appears on the property IFF). The physical address of the property being sampled. Addresses are to be entered in the following format:
Street number – Direction – Street Name – Street Abbreviation

Where:

Street number = the number of the street address
Direction = the abbreviation of the street direction (N, S, E, or W), when applicable
Street name = correct spelling of the street name
Street abbreviation = when applicable

Road – Rd
Avenue – Ave
Street – St
Circle – Cr
Place – Pl
Boulevard – Blvd
Highway - Hwy

Examples: 510 N Mineral Ave
607 N Michigan Ave
521 Pipe Creek Rd

Property Identification Number: AD-▢▢▢▢▢▢
The AD-Number is provided by the TAPE field office coordinator and is a unique six-digit number for each Troy property.

Building Identification Number: BD-▢▢▢▢▢
For dust samples, the location identification is in the form of a five-digit BD-#####. The BD number is the number assigned to the structure the dust sample is collected in. BD numbers are assigned to each sampling team by the TAPE field office coordinator.

Owner: (As it appears on the property IFF). The name of the property owner (not necessarily the current occupant).

Building Description: Description of primary function for the building being sampled (circle one of the uses provided or write in description for others.

Building Use: Further defines the use for the building being sampled (circle one of the uses provided or write in description for others.

Date: Date samples are collected, in the form MM/DD/YY.

Field Logbook No.: The logbook number being used to record information specific to the samples on the FSDS.

Page No.: Page numbers in logbook with information for samples recorded on the FSDS.

Sampling Team: The names and company affiliation of sampling team.

1.2.2 Main Section of the FSDS

The following information items are provided in the Main Section of the FSDS. If more than 3 dust samples are collected at a Troy building, an additional FSDS page must be completed.

Sample ID (TT): Each sample identification (ID) number is a unique five-digit number provided to the field team by the TAPE field office coordinator. Pre-printed, self-adhesive Sample ID numbers will be provided to the TAPE field teams in triplicate for labeling the FSDS column. the sample bag, and the field logbook page. Sample ID numbers for the TAPE field project are in the form TT- # # # # #.

Location Description (room): Provide a description of the building floor and room where the dust sample is collected. Use directional coordinates and a sketch in the field logbook to ensure that enough information is provided for each Sample TT location.

Category: FS = field sample; FD = field duplicate; or Blank.

Matrix Type: The dust samples collected for the TAPE field project will mostly be building floor dust samples (Building). A dust sample may also be collect from a vehicle or from some other matrix (Other).

Sample Area: Circle the amount of area sampled with the cassette.

Filter Diameter: Circle the appropriate filter diameter.

Pore Size: Circle the appropriate pore size.

Flow Meter Type: Circle the type of flow meter used to calibrate the pump flow rate.

Flow Meter ID No.: Record the identification number of the flow meter used to calibrate the pump flow rate.

Pump ID No.: Record the identification number of the pump used to collect the sample.

Start Time: Record the starting time of each sample aliquot collection, in military time.

Start Flow: Record the starting pump flow rate for the sample colleted in Liters per minute (L/min).

Stop Time: Record the stopping time of each sample aliquot collection, in military time.

Stop Flow: Record the stopping pump flow rate for the sample colleted in minute L/min.

Pump Fault: If the pump faulted during sample collection, circle Yes. If the pump did not fault during sample collection, circle No.

Map Location: Describe the approximate location of the dust sample on a sketch in the logbook. Record the logbook page number on the top of the Dust Sampling FSDS.

Field Comments: For each 100cm2 aliquot locations, record the specific location sampled.

Entered: Completed by Volpe personnel at time of data entry.

Validated: Completed by Volpe personnel at time of data entry check.

TROY ASBESTOS PROPERTY EVALUATION (TAPE)

PROJECT-SPECIFIC GUIDANCE

TAPE Surface Soil Sampling
Version 01

Prepared for:
MONTANA DEPARTMENT OF ENVIRONMENTAL QUALITY
P.O. Box 200901
Helena, MT 59620-0901

Prepared by:
TETRA TECH EM INC.
7 West 6th Avenue
Helena, MT 59601

Date:
March 13, 2006

1.0 BACKGROUND AND PURPOSE

The purpose of this TAPE project-specific guidance is to provide a standardized method for surface (0 to 1 inch) and shallow subsurface (0 to 6 inch) soil sampling to be used by the Montana Department of Environmental Quality (MDEQ) and their contractor, Tetra Tech, while completing work for the Troy asbestos property evaluations (TAPE) for the Libby Asbestos Project in Libby, Montana. This guidance describes the equipment and operations used for sampling surface and subsurface soils in residential areas, which will be submitted for the analysis of Libby amphiboles.

The MDEQ project manager must approve site-specific deviations from the procedures outlined in this document prior to initiation of the sampling activity. This guidance provides the protocols for selecting sample locations and for composite surface-soil sampling. Field personnel performing soil sampling are responsible for adhering to the applicable tasks outlined in this project-specific guidance while collecting samples at residences. The field personnel should have limited discretion with regard to collection procedures, but should exercise judgment regarding the exact location of the sample point, within the boundaries outlined by the TAPE field team leader.

2.0 TAPE OUTDOOR SOIL SAMPLING PROCEDURES

Each property will be segregated into land use areas for sampling purposes. Use areas may include, but are not be limited to:

- Yard (grassy area)
- . Landscaped area
- . Garden
- . Fill area
- . Driveway

The areas of the Troy properties that are not covered by buildings will be grouped into two general types: (1) outdoor yards and open space, and (2) specific use areas. Figure 3-2 in the TAPE Workplan provides typical outdoor soil sampling designs for these two general types of outdoor areas. Properties with grassy areas greater than approximately 5,000 square feet (ft^2) in size will be sectioned off into separate zones for increased accuracy in characterization. This

segregation will be accomplished so that a five-point composite sample will characterize each section.

Sample Number and Location: A minimum of two and up to five composite soil samples will be collected from outside areas at each property. Composite soil sampling requires soil collection from multiple (sub-sample) points. Composite samples will be collected from similar land use areas (for example, yard, garden, stockpiled soil). Additional composite or individual grab samples may be collected depending on specific property conditions (for example, multiple land use areas or zones). Not all Troy properties will have definable land use areas, however, the TAPE field team will attempt to collect a minimum of two soil samples from each Troy property.

A surface soil sample will be collected from the 0 to 1 inch depth at sample points within non-disturbed areas (grassed yards). For disturbed areas (driveways, gardens, fill areas, and landscaped areas), composite soil samples will be collected from 0 to 6 inch depth. All composite soils samples will have five subsamples (aliquots) of approximately equal size. When vermiculite is observed in a land use areas (driveways and yards), a soil sample should be collected from that land use area. The location where any vermiculite is observed during soil sampling should be recorded in the field logbook and on the IFF.

Sample Collection: Field samplers should don the appropriate PPE as specified in the HASP. New plastic gloves are to be worn for each sample collected. Segregate the Troy property into land use areas, as described above. Visually inspect each land use area for visual vermiculite product. To reduce dust generation during sampling, use a sprayer with distilled water to wet each sample point prior to collection. Use the trowel to check beneath the surface soil layer, but do not advance more than 6 inches. If visible vermiculite is observed, that information should be recorded on the appropriate field forms for that land use area. Sample locations should be selected as described

Within each land use area, select five subsample locations equidistant from each other (Figure 3-2). These five subsample locations will comprise the five-point composite sample for that land use area. All composite subsamples should be from the same land use area. For example, do not mix subsamples from a garden area with subsamples from a grassy area.

Remove twigs, leaves, and other vegetative material that can be easily removed by hand at each subsample location. Using the trowel, excavate soil from an area approximately 2 inches in diameter and 1 inch deep (6 inches deep for disturbed areas) and place the excavated material directly inside a 1-gallon size reclosable plastic bag. The sides of the excavated hole should be close to vertical to avoid sampling that is biased in favor of the upper layer of soil. Repeat this step for the remaining four subsamples until the composite subsamples has been collected. The reclosable plastic bag should be approximately 1/3 to ½ full.

Homogenize the sample by first closing the plastic bag and then vigorously kneading and working the soil back and forth. Some samples may require one minute, or more, of mixing in order to thoroughly homogenize. A pre-printed, self-adhesive sample ID label will be attached to the outside of the plastic sample bag. The sample will then be double bagged and the labeling process repeated for the outer sample bag. Decontaminate the trowel between each composite soil sample, as described below.

Repeat the soil sampling steps outlined above until all soil samples from a property have been collected. Soil field duplicate samples will be collected at a rate of 1 per 20 (5 percent) of the field samples. Field duplicate samples will be collected as samples co-located in the same land use area. The duplicate will be collected from the same number of subsamples as the parent sample, but the subsample locations of the duplicate sample will be randomly located in the use area. These samples will be independently collected with separate sampling equipment. The duplicate soil samples will be used to determine the variability of sample results in a given land use area and will not be used to determine variability in sampling techniques.

Sample Location Restoration: The volume of soil removed by the TAPE sampling is small, but care will be used to return and restore each subsample point location to near pre-sampling appearance. For most sample locations, the small area can be replaced with soil from immediately surrounding the excavation and lightly tamped down. In addition, each TAPE field team will have some commercially-available potting soil or quality topsoil available to repair any small excavations that cannot be easily filled with nearby soil materials. If the sample location is a sandy area, such as a playground, refilling the soil plug will not be necessary.

Sample Decontamination: Rinse water, the roots of vegetation removed during sampling, and any small volume of excess soil may be disposed of on the ground as specified in the TAPE Workplan. A small metal shovel (if needed) and plastic trowels are the only sampling equipment that will be reused and thus requiring decontamination between sampling. All soil sampling equipment will be thoroughly decontaminated prior to any sampling use. Specific instructions on sample equipment decontamination are included in TAPE Workplan. In general, the procedure to decontaminate all equipment is outlined below:

Decontamination procedures for soil sampling equipment will follow these steps:

- Remove all gross contamination with plastic brush
- Use distilled (DI) water and a plastic brush to wash each piece of equipment
- Remove excess water present on the equipment by shaking
- Use a paper towel to dry each piece of equipment
- Wrap dried equipment in aluminum foil

Once a week all soil sampling equipment will be cleaning using Alconox and DI water.
Spent wipes, gloves, and PPE must be disposed or stored properly as specified in the TAPE Workplan.

3.0 LISTED EQUIPMENT AND RESOURCES

TAPE soil sampling may require the use of one or more of the following types of equipment and resources:

Sampling Equipment:
Trimble pro-XRS GPS unit
Digital camera
Scale bars for photographs
Phone or radio
Clipboard
Tape Measure (6 x 50-foot)
Field log book
Pocket knife
Re-closable plastic bags
Wet wipes
Waterproof permanent markers
Small metal shovel
Disposable soil trowels/scoops
Sample labels
Silica sand (asbestos-free) for soil field blanks
Secure shipment containers
Trash bags

PPE:
Disposable protective outerwear
Vinyl/nitrile gloves, various sizes

Decon:
Paper towels
Bristle brushes
Water spray bottles
5-gallon buckets
Surfactant (Alconox)
Distilled (DI) water

Field Forms:
IFFs
FSDSs
Interview forms
Field audit forms

Health and Safety Plan

for

Troy Asbestos Property Evaluation (TAPE)

HEALTH AND SAFETY PLAN

Troy Asbestos Property Evaluation

Contract No.	:	DEQ 402014-TO41
	:	
Date Prepared	:	12/30/05
Prepared by	:	Tetra Tech EM Inc. (Tetra Tech)
Tech Project Manager	:	J. Edward Surbrugg, Ph.D.
Telephone No.	:	(406) 442-5588

REVIEWS AND APPROVALS

CLIENT NAME:
CONTRACT NO.:

We the undersigned have read and approve of the health and safety guidelines presented in this health and safety plan for on-site work activities for the Troy Asbestos Property Evaluation project.

Name	Signature	Date
Glynis Foulk Tetra Tech EM Inc. (Tetra Tech) Health and Safety Representative (916) 853-4561		
J. Edward Surbrugg, Ph.D. Tetra Tech Project Manager		

This certifies that Tetra Tech has assessed the type, risk level, and severity of hazards for the project and has selected appropriate personal protective equipment for site personnel in accordance with Occupational Safety and Health Administration Title 29 of the *Code of Federal Regulations*, Part 1910.132.

Certified by

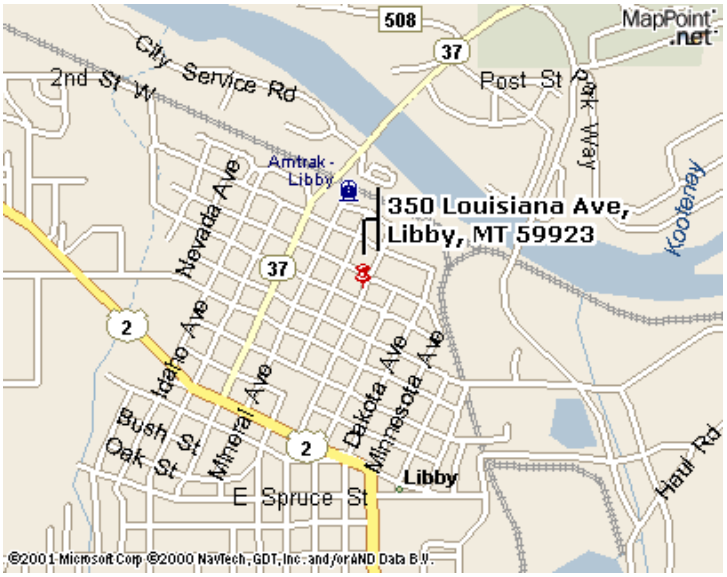
Glynis Foulk Tetra Tech Technical Reviewer		

EMERGENCY INFORMATION
EMERGENCY CONTACTS AND ROUTE TO HOSPITAL

Emergency Contact	**Telephone No.**
U.S. Coast Guard National Response Center	(800) 424-8802
Montana Department of Emergency Services	(406) 431-0411
InfoTrac Chemical Monitoring System	(800) 535-5053
Fire Department	911
Police Department	911
Tetra Tech EM Inc. Personnel:	
Human Resource Development: Amy Clark	(626) 351-4664
Health and Safety Representative: Glynis Foulk	(678) 775-3094
Office Health and Safety Coordinator: Sandra Hertweck	(406) 442-5588, ext. 221
Project Manager: J. Edward Surbrugg	(406) 442-5588, ext. 230
Site Safety Coordinator: Mark Stockwell	(208) 263-4524
Client Contact: Catherine LeCours	(406) 841-5040
Client Title: Montana DEQ Project Officer	
Medical Emergency	
Hospital Name:	St. John's Lutheran Hospital
Hospital Address:	350 Louisiana Avenue Libby, MT 59923
Hospital Telephone No.: General – 406-293-0100	Emergency – 911
Ambulance Telephone No.:	911
Route to Hospital: (see next page, hospital route map)	
1. Routes will differ from each sample site.	

Note: This sheet must be posted on site.

EMERGENCY INFORMATION
HOSPITAL ROUTE MAP



Note: This sheet must be posted on site.

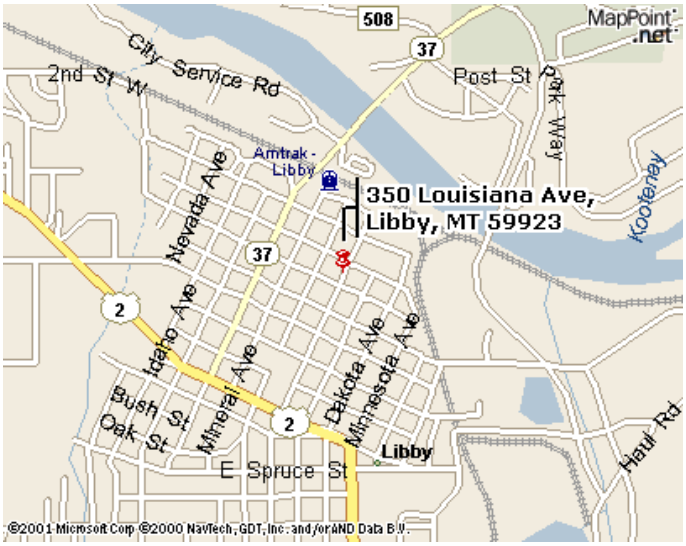
EMERGENCY INFORMATION

EMERGENCY CONTACTS AND ROUTE TO HOSPITAL

Medical Emergency (secondary – use for major emergency only)	
Hospital Name:	St. John's Lutheran Hospital
Hospital Address:	350 Louisiana Avenue, Libby, MT 59923
Hospital Telephone No.:	Emergency – 911 or General – 406-293-0100
Ambulance Telephone No.:	911
Route to Hospital: (see next page hospital route map) 1. Routes will differ from each sample site.	

EMERGENCY INFORMATION

HOSPITAL ROUTE MAP



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Appendix

Attachment

FIGURES

Figure **Page**

TABLES

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1.0 INTRODUCTION

This document addresses items specified under Occupational Safety and Health Administration (OSHA) Title 29 of the *Code of Federal Regulations* (CFR), Part 1910.120 (b), "Final Rule." This health and safety plan (HASP) will be available to all on-site personnel who may be exposed to hazardous on-site conditions, including Tetra Tech EM Inc. (Tetra Tech) and subcontractor personnel, and all site visitors and regulatory agency representatives. The site-specific health and safety provisions in this document have been developed for use during the Troy Asbestos Property Evaluation (TAPE) inspection and sampling

This HASP defines requirements and designates protocols to be followed during the TAPE inspection and sampling. All personnel on site, including Tetra Tech and subcontractor employees and site visitors, must be informed of site emergency response procedures and any potential health or safety hazards associated with on-site activities. This HASP summarizes potential hazards and defines protective measures planned for activities at the site.

This plan must be reviewed and approved by the Tetra Tech health and safety representative (HSR) or a designee and the Tetra Tech project manager (see the Reviews and Approvals form after the contents in this document). All personnel must sign the Compliance Agreement form in Appendix A before they enter the site. Protocols established in this HASP are based on site conditions and health and safety hazards known or anticipated to be present and on available site data. This plan is intended solely for use during proposed activities described in the corresponding site-specific work plan. Specifications are subject to review and revision based on actual conditions encountered in the field during site activities. The Tetra Tech project manager and the Tetra Tech HSR must approve significant revisions to this plan. Tetra Tech employees must also follow safety requirements taught during safety training and described in the Tetra Tech, Inc., "Health and Safety Manual" (1999).

2.0 HEALTH AND SAFETY PLAN ENFORCEMENT AND PERSONNEL

This section describes responsibilities of project personnel, summarizes requirements for subcontractors and visitors who wish to enter the site during the survey and sampling, and discusses HASP enforcement.

2.1 PROJECT PERSONNEL

The following personnel and organizations are associated with planned activities at the site. The organizational structure will be reviewed and updated as necessary during the course of the project.

Name/Title	Responsibility	Telephone No.
Client Representative:		
Ms. Catherine LeCours	Montana Department of Environmental Quality (DEQ) Representative	(406) 841-5040
Tetra Tech Personnel:		
J. Edward Surbrugg	TAPE Project Manager	(406) 442-5588 x 230
Brian Antonioli	Contract Manager	(406) 442-5588 x 235
Mark Stockwell	Site Safety Coordinator (SSC)	(208) 263-4524
Mark Stockwell	Field Team Leader	(208) 263-4524

The Tetra Tech project manager, contract manager, SSC, and field team leader will be responsible for implementation and enforcement of the provisions of this HASP, including completion of all applicable forms provided as appendices to this health and safety plan. Their duties and the expectations for Tetra Tech employees are described in the following sections.

2.1.1 Project Manager and Field Manager

The Tetra Tech project manager has ultimate responsibility for implementing the requirements set forth in this HASP. Some of this responsibility may be achieved through delegation to site-dedicated personnel who report directly to the project manager. The project manager shall regularly confer with site personnel on compliance with safety and health requirements.

The Tetra Tech field team leader will oversee and direct field activities and has day-to-day responsibility for implementing the HASP. The field manager will report directly to the project manager any health and safety-related issues.

2.1.2 Site Safety Coordinator

The Tetra Tech SSC will be appointed by the project manager and will be responsible for field implementation of tasks and procedures contained in this HASP, including air monitoring, establishing a decontamination protocol, and ensuring that all personnel working on site have signed the Daily Tailgate Safety Meeting form (Form HST-2) and the Compliance Agreement (Form HSP-4) (see Appendix A). The SSC will have advanced field work experience and be familiar with health and safety requirements specific to the project. The SSC will also maintain the Daily Site Log (Form SSC-1 in Appendix A).

2.1.3 Health and Safety Representative

The Tetra Tech HSR is responsible for administration of the company health and safety program. The HSR will act in an advisory capacity to project managers and site personnel for project-specific health and safety issues.

2.1.4 Tetra Tech Employees

Tetra Tech employees are expected to fully participate in implementing the site HASP by obtaining necessary training, attending site safety meetings, always wearing designated personal protective equipment (PPE), complying with site safety and health rules, and advising the Tetra Tech SSC of health and safety concerns at the site.

2.2 SUBCONTRACTORS

Subcontractors will follow and adhere to the same guidelines stated in Section 2.1.4

2.3 VISITORS

All site visitors will be required to read the HASP and sign the Compliance Agreement form (see Appendix A). Visitors will be expected to comply with relevant OSHA requirements. Visitors will also be expected to provide their own PPE as required by the HASP. Visitors who have not met OSHA requirements for training, medical surveillance, and PPE are not permitted to enter areas where exposure to hazardous materials is possible.

2.4 HEALTH AND SAFETY PLAN ENFORCEMENT

This HASP applies to all site activities and all personnel working on the TAPE project. HASP enforcement shall be rigorous. Violators of the HASP will be verbally notified on first violation, and the Tetra Tech SSC will note the violation in a field logbook. On a second violation, the violator will be notified in writing, and the Tetra Tech project manager and the violator's supervisor will be notified. A third violation will result in a written notification and the violator's eviction from the site. The written notification will be sent to human resources development and the HSR.

Personnel will be encouraged to report to the SSC any conditions or practices that they consider detrimental to their health or safety or that they believe violate applicable health and safety standards. These reports may be made orally or in writing. Personnel who believe that an imminent danger threatens human health or the environment are obligated to remove themselves from the area or the hazardous condition and warn all other personnel of the source of the danger. The hazardous condition or matter will be brought to the immediate attention of the SSC for resolution.

At least one copy of this HASP will be available to all site personnel at all times. The SCC will discuss minor changes in HASP procedures at the beginning of each workday at the daily tailgate safety meeting. Significant plan revisions must be discussed with the HSR and project manager.

3.0 SITE BACKGROUND

The TAPE inspection and sampling project will include collecting samples of dust and soil from private and public property to evaluate the magnitude and extent of asbestos contamination and develop viable remedial alternatives. The following sections describe the TAPE site, its history, and activities planned for this project. The location of Troy, Montana, can be found in Figure 1.

FIGURE 1 – SITE LOCATION

3.1 SITE DESCRIPTION

Troy, Montana, is located 18 miles from Libby, Montana. Through 1990, a vermiculite mine and associated processing operations in Libby produced a large amount of the world's supply of vermiculite. The vermiculite deposit is contaminated with a form of amphibole asbestos (Libby amphibole). Asbestos is a known carcinogen and is associated with a multitude of respiratory health effects, including asbestosis, lung cancer, and mesothelioma. For decades, contaminated vermiculite and waste materials were ubiquitous in the community while the mine operated and after its closure. Many of the mine workers lived in Troy and commuted to the mine to work because Troy is close to Libby. Workers were exposed to contaminated materials at the mine and processing facilities; they transported contaminated dust to their homes on clothes and equipment; and vermiculite and contaminated waste rock in varying forms was used in soils (as fill or an amendment), construction materials, and for insulation all around the town.

In 1999, U.S. Environmental Protection Agency (EPA) Region 8 dispatched an emergency response team to investigate in response to media reports that described a high rate of asbestos-related deaths in Libby. Originally believed to be a problem limited to the mine workers, the scope has increased. Subsequent environmental investigations have found many areas in Libby with LA contamination. EPA began Superfund emergency response removal actions in Libby in 2000 that are ongoing through 2007. Properties in Troy are being investigated to evaluate whether LA-contaminated vermiculite has been transported to these sites and at concentrations that would pose health risks to the occupants.

3.2 PLANNED ACTIVITIES

Activities to be performed during the TAPE include the following…

Indoor Inspections: The two-person sampling team will visually inspect each structure for the presence of vermiculite-containing insulation (VCI).

Indoor dust sampling: Dust samples will be collected using microvac sampling techniques in all primary and secondary structures.

Outdoor Inspection: All areas of a property that are not covered with structures or special use areas will be inspected for vermiculite product in soil and surfacing materials.

Outdoor Soil Sampling: After conducting the visual inspection of the property, the sampling team will collect soil samples.

These tasks are described in detailed in Section 4 of the TAPE work plan.

4.0 EVALUATION OF SITE-SPECIFIC HAZARDS

Field activities and physical features of the site may expose field personnel to a variety of hazards. This section provides information on potential hazards related to site activities and the nature of effects from hazardous materials.

4.1 CHEMICAL HAZARDS

Tremolite-actinolite asbestos is the only potentially hazardous substance anticipated to be encountered during site activities. Potential routes of exposure, exposure limits, and the toxic characteristics of asbestos are listed in Table 4-1. The primary route of exposure is inhalation; however, secondary potential routes of exposure include dermal (skin) contact and ingestion. Asbestos may also contaminate equipment, vehicles, instruments, and personnel. The overall health threat from exposure to asbestos is uncertain because (1) actual concentrations that personnel could be exposed to cannot be predicted, (2) the actual duration of exposure is unknown, and (3) the effects of low-level exposure to a mixture of chemicals or asbestos cannot be predicted. However, Tetra Tech believes that the potential for high-level exposure is limited.

Specific information on potential chemical hazards at the site is provided in Table 4-1. Table 4-2 provides a task hazard analysis of the activities planned and listed in Section 3.2.

Tetra Tech will not bring any potentially hazardous materials to the site during the field activities. Because of the nature of asbestos sampling, all PPE and monitoring equipment can be decontaminated using soap and water. Air monitoring equipment to be used during this project will be calibrated without the use of hazardous materials.

TABLE 4-1

POTENTIAL CHEMICAL HAZARDS
TAPE INSPECTION AND SAMPLING PROJECT

Chemical	Exposure Limits and IDLH Level	Exposure Routes	Toxic Characteristics
Asbestos	OSHA PEL: 0.1 fiber/cm^3 (8 hour TWA) ACGIH TLV: 0.1 fiber/cm^3 IDLH: Not Established	Inhalation (primary), ingestion, skin or eye contact	Asbestosis, lung cancer, mesothelioma

Notes:

ACGIH American Conference of Governmental Industrial Hygienists
IDLH Immediately dangerous to life or health
cm^3 Cubic centimeter
OSHA Occupational Safety and Health Administration
PEL Permissible exposure limit
ppm Part per million
TLV Threshold limit value
TWA Time weighted average

Sources: ACGIH. "Threshold Limit Values and Biological Exposure Indices for 1998." Latest edition.

National Institute for Occupational Safety and Health. 1997. "Pocket Guide to Chemical Hazards." U.S. Department of Health and Human Services. U.S. Government Printing Office. Washington, DC. June.

TABLE 4-2

TASK HAZARD ANALYSIS
TAPE Inspection and Sampling Project

Task	Potential Hazard	Controls	Initial Level of Protection	Upgraded Level of Protection
Task 1 – Interior Attic Evaluations and dust sampling	Potential asbestos exposure. Physical hazards include confined space entry; and slip, trip, fall, and overhead hazards. Risks associated with ladder use. Risks associated with falls between roof trusses.	Use of buddy system at all times, use of flashlights when necessary, hazard awareness. Sampling will be conducted to limit the potential for exposure. Sample areas will be wetted before samples are collected, when necessary. Performance of personal air monitoring at selected locations. Follow Safe Work Practices (SWP).	Level C protection when accessing all attic spaces	Potential for upgrade to level C protection may be necessary using P-100 cartridges. Full or ½ face respirator can be used. Decision to upgrade to be made by the SSC/field manager based on site conditions, monitoring results, and presence of friable asbestos.
Task 2 – Exterior yard and open area inspections and soil sampling	Potential asbestos exposure. Physical hazards include slip, trip, and falls.	Use of buddy system and hazard awareness. Follow SWPs.	Level D protection	Decision to upgrade to be made by the SSC/Field Manager based on site conditions, monitoring results, and presence of friable asbestos.

The following steps will be taken o reduce the potential for inhaling asbestos:

- Personnel will avoid sampling methods and procedures that would render nonfriable asbestos-containing material (ACM) friable.
- The level of PPE shall be upgraded from level D to level C at any time that sampling conditions warrant, as determined by the SSC or field manager.

4.2 PHYSICAL AND BIOLOGICAL HAZARDS

Physical and biological hazards associated with site activities present a potential threat to on-site personnel. Dangers are posed by slippery surfaces, unseen obstacles, poor illumination, use of ladders, and low overhead clearance, as well as insects, Hantavirus, and hostile animals.

Injuries resulting from physical and biological hazards can be avoided by using safe work practices (SWP). To maintain a safe workplace, the SSC will conduct and document regular safety inspections and will make sure that all Tetra Tech workers and visitors are informed of any potential physical and biological hazards related to the site. Physical and biological hazards that have been identified at this site include the following:

- Spiders, including brown recluse and black widow
- Potential disease agents from animal/bird feces, including Hantavirus
- Hostile domestic or stray animals
- Use of ladders and other equipment to access attics and areas for sample collection
- Trips, slips, falls in yards and open areas
- Heat stress
- Cold stress
- Fall hazard (from ladders and through roof trusses in attics)
- Potential confined space entry – no permits are anticipated to be necessary for sampling, however,

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5.0 TRAINING REQUIREMENTS

All on-site personnel who may be exposed to hazardous conditions, including Tetra Tech and subcontractor personnel and site visitors who will participate in on-site activities, will be required to meet training requirements outlined in 29 CFR 1910.120, "Hazardous Waste Operations and Emergency Response." All personnel and visitors entering the site will be required to review this HASP and sign the Compliance Agreement form (HSP-4), and site workers will be required to sign the Daily Tailgate Safety Meeting form (HST-2) (see Appendix A).

Personnel collecting asbestos samples will, at a minimum, be licensed asbestos inspectors in the State of Montana and be 40-hour HAZWOPER trained.

Before on-site activities begin, the Tetra Tech SSC will present a briefing for all personnel who will participate in on-site activities. The following topics will be addressed during the prework briefing:

- Names of the SSC and the designated alternate
- Site history
- Tasks
- Hazardous chemicals that may be encountered on site
- Physical hazards that may be encountered on site
- PPE, including type or types of respiratory protection to be used for work tasks
- Training requirements
- Action levels and situations requiring upgrade or downgrade of level of protection
- Site control measures, including site communications, and SWPs
- Decontamination procedures
- Emergency communication signals and codes
- Personnel exposure and accident emergency procedures (in case of falls, exposure to hazardous substances, and other hazardous situations)
- Emergency telephone numbers
- Emergency routes

Any other health and safety-related issues that may arise before on-site activities begin will also be discussed during the pre-work briefing.

Issues that arise during on-site activities will be addressed during tailgate safety meetings to be held daily before the workday or shift begins that will be documented in the Daily Tailgate Safety Meeting form (Form HST-2 in Appendix A). Any changes in procedures or site-specific health and safety-related matters will be addressed during these meetings.

6.0 PERSONAL PROTECTION REQUIREMENTS

The levels of PPE to be used for work tasks during the TAPE will be selected based on known or anticipated physical hazards; types and concentrations of contaminants that may be encountered on site; and contaminant properties, toxicity, exposure routes, and matrices. The following sections describe protective equipment and clothing; reassessment of protection levels; limitations of protective clothing; and respirator selection, use, and maintenance.

6.1 PROTECTIVE EQUIPMENT AND CLOTHING

Personnel will wear protective equipment when (1) site activities involve known or suspected contamination; (2) site activities may generate asbestos particulates; or (3) direct contact with hazardous materials may occur. The anticipated levels of protection selected for use by field personnel during site activities are listed in Table 4-2, Task Hazard Analysis. Based on the anticipated hazard level, personnel will initially perform field tasks in level D protection.

If site conditions or the results of air monitoring during on-site activities warrant a higher level of protection, all field personnel will immediately notify the Tetra Tech SSC. Based on the initial site walk-through and conditions encountered during sample collection, a PPE upgrade to level C protection is anticipated in some of the areas to be sampled. This PPE upgrade will typically occur whenever vermiculite-containing insulation (VCI) or Libby vermiculite (LV) is encountered. Equipment and clothing required for level D and level C protection are described below.

- Level D
  - Coveralls or work clothes, if applicable
  - Chemical-resistant clothing (such as Tyvek or Saranex coveralls)
  - Disposable gloves (latex or vinyl), if applicable
  - Work gloves, if applicable

- Boots with steel-toe protection and steel shanks
- Disposable boot covers or chemical-resistant outer boots, if applicable
- Safety glasses or goggles
- Hard hat (face shield optional)
- Hearing protection (for areas with a noise level that exceeds 85 decibels on the A-weighted scale)

- Level C
  - Coveralls or work clothes, if applicable
  - Chemical-resistant clothing (such as Tyvek or Saranex coveralls)
  - Outer gloves (neoprene, nitrile, or other), if applicable
  - Disposable inner gloves (latex or vinyl)
  - Boots with steel-toe protection and steel shanks
  - Disposable boot covers or chemical-resistant outer boots
  - Full- or half-face, air-purifying respirator with National Institute for Occupational Safety and Health (NIOSH)-approved cartridges to protect against organic vapors, dust, fumes, and mists. (Cartridges used for gas and vapors must be replaced in accordance with the change-out schedule described in the Respiratory Hazard Assessment form [Form RP-2] in Appendix C.) P-100 cartridges will be used.
  - Safety glasses or goggles (with a half-face respirator only)
  - Hard hat (face shield optional)
  - Hearing protection (for areas with a noise level that exceeds 85 decibels on the A-weighted scale)

6.2 REASSESSMENT OF PROTECTION LEVELS

PPE levels will be upgraded or downgraded based on a change in site conditions or findings of the investigation. Hazards will be reassessed when a significant change in site conditions occurs. Some indicators of the need for reassessment are as follows:

- Commencement of a new phase of work, such as the start of a significantly different sampling activity or work that begins on a different portion of the site
- Potential for release of amphibole asbestos
- A change in tasks during a work phase
- A change of season or weather

- Temperature extremes or individual medical considerations that would limit the effectiveness of PPE
- Discovery of contaminants other than were previously identified
- A change in ambient levels of airborne contaminants (see the action levels listed in Table 8-1)
- A change in work scope that affects the degree of contact with contaminated media

6.3 LIMITATIONS OF PROTECTIVE CLOTHING

PPE clothing ensembles designated for use during site activities have been selected to protect against contaminants at known or anticipated on-site concentrations and physical states. However, no protective garment, glove, or boot is entirely chemical-resistant, nor does any protective clothing protect against all types of chemicals. Permeation of a chemical through PPE depends on the contaminant concentration, environmental conditions, the physical condition of the protective garment, and the resistance of the garment to the specific contaminant. Chemical permeation may continue even after the source of contamination has been removed from the garment.

All site personnel will use the following procedures to obtain optimum performance from PPE.

- When chemical-protective coveralls become contaminated, don a new, clean garment after each rest break or at the beginning of each shift.
- Inspect all clothing, gloves, and boots both before and during use for the following:
  - Imperfect seams
  - Nonuniform coatings
  - Tears
  - Poorly functioning closures
- Inspect reusable garments, boots, and gloves both before and during use for visible signs of chemical permeation, such as the following:
  - Swelling
  - Discoloration
  - Stiffness
  - Brittleness
  - Cracks
  - Punctures

- Abrasions

Reusable gloves, boots, or coveralls that exhibit any of the characteristics listed above must be discarded. Reusable PPE will be decontaminated in accordance with procedures described in Section 10.0 and will be neatly stored in the support zone away from work zones.

6.4 RESPIRATOR SELECTION, USE, AND MAINTENANCE

Tetra Tech personnel will be informed of the proper use, maintenance, and limitations of respirators during annual health and safety refresher training and the prework briefing. Any on-site personnel who will use a tight-fitting respirator must pass a qualitative fit test for the respirator that follows the fit testing protocol provided in Appendix A of the OSHA respirator standard (29 CFR 1910.134). Fit testing must be repeated annually or when a new type of respirator is used.

Respirators are selected based on the assessment of the nature and extent of hazardous atmospheres anticipated during field activities. This assessment includes a reasonable estimate of employee exposure to respiratory hazards and identification of each contaminant's anticipated chemical form and physical state.

A respiratory hazard assessment has been conducted for each task that will require use of a respirator during the TAPE project. The results of this assessment are documented in the Respiratory Hazard Assessment form (Form RP-2), which has been approved by the HSR. The completed Form RP-2 is included in Appendix C and defines respiratory protection requirements for the project. Amendments to this HASP and to Form RP-2 will be discussed during daily tailgate safety meetings.

When the atmospheric contaminant is identified and its concentration is known or can be reasonably estimated, respiratory protection options include the following:

- An atmosphere-supplying respirator (air-line or SCBA)
- An air-purifying respirator equipped with a NIOSH-certified, end-of-service-life indicator (ESLI) for the identified contaminant. If no ESLI is available, a change-out schedule for cartridges must be developed based on objective data or information. The HSR will evaluate respirator cartridge selection and change-out schedules during the respiratory hazard assessment. The Respiratory Hazard Assessment, Form RP-2, will describe the information and data used as the basis for the cartridge change-out schedule and the proposed change schedule.

For protection against particulate contaminants including friable asbestos, approved respirators can include the following:

- An atmosphere-supplying respirator
- A respirator equipped with a filter certified by NIOSH under 32 CFR Part 11 or 42 CFR Part 84 as a P100 filter (formerly known as a high-efficiency particulate air [HEPA] filter)

A full- or half-face, air-purifying respirator equipped with NIOSH-approved cartridges or filters will be selected to protect against particulates, vapors, gases, and aerosols for any tasks performed in level C PPE.

Air-purifying respirators will be used only in conjunction with breathing-space air monitoring, which must be conducted in adherence to the action levels outlined in Table 8-1. Air-purifying respirators will be used only when they can protect against the substances encountered on site.

Factors that would preclude use of level C and air-purifying respirators are as follows:

- Oxygen-deficient atmosphere (less than 19.5 percent oxygen)
- Concentrations of substances that may be immediately dangerous to life and health
- Confined or unventilated areas that may contain airborne contaminants not yet characterized
- Unknown contaminant concentrations or concentrations that may exceed the maximum use levels for designated cartridges documented in the selected cartridge manufacturer's instructions
- Unidentified contaminants
- High relative humidity (more than 85 percent, which reduces the sorbent life of the cartridges)
- Respirator cartridges with an undetermined service life

Use, cleaning, and maintenance of respirators are described in SWP 6-27, Respirator Cleaning Procedures, and SWP 6-28, Safe Work Practices for Use of Respirators. These SWPs are included in Appendix B.

7.0 MEDICAL SURVEILLANCE

The following sections describe Tetra Tech's medical surveillance program, including health monitoring requirements, site-specific medical monitoring, and medical support and follow-up requirements. Procedures documented in these sections will be followed for all activities during the TAPE project. Additional requirements are defined in the Tetra Tech, Inc., "Health and Safety Manual."

7.1 HEALTH MONITORING REQUIREMENTS

All Tetra Tech and subcontractor personnel involved in on-site activities for the TAPE project must participate in a health monitoring program as required by 29 CFR 1910.120(f). Tetra Tech has established a health monitoring program with WorkCare, Inc., of Orange, California. Under this program, Tetra Tech personnel receive baseline and annual or biennial physical examinations consisting of the following:

- Complete medical and work history
- Physical examination
- Vision screening
- Audiometric screening
- Pulmonary function test
- Resting electrocardiogram
- Chest x-ray (required once every 3 years)
- Blood chemistry, including hematology and serum
- Urinalysis
- For sampling asbestos licensed workers will meet the medical monitoring requirements of their licenses

Tetra Tech receives a copy of the examining physician's written opinion for each employee after post-examination laboratory tests have been completed; the Tetra Tech employee also receives a copy of the written opinion. This opinion includes the following information (in accordance with 29 CFR 1910.120[f][7]):

- The results of the medical examination and tests
- The physician's opinion as to whether the employee has any medical conditions that would place the employee at an increased risk of health impairment from work involving hazardous waste operations or during an emergency response
- The physician's recommended limitations, if any, on the employee's assigned work; special emphasis is placed on fitness for duty, including the ability to wear any required PPE under conditions expected on site (for example, temperature extremes)
- A statement that the employee has been informed by the physician of the medical examination results and of any medical conditions that require further examination or treatment

All subcontractors must have health monitoring programs conducted by their own clinics in compliance with 29 CFR 1910.120(f). Any visitors or observers at the site will be required to provide records in compliance with 29 CFR 1910.120(f) before they can enter the site.

7.2 MEDICAL SUPPORT AND FOLLOW-UP REQUIREMENTS

All employees are entitled to and encouraged to seek medical attention and physical testing as a follow-up to an injury that requires care beyond basic first aid or to possible exposure above established exposure limits. These injuries and exposures must be reported to the HSR. Depending on the type of injury or exposure, follow-up testing, if required, must occur within 24 to 48 hours of the incident. It will be the responsibility of the employer's medical consultant to advise the type of test required to accurately monitor for exposure effects. The Tetra Tech SSC must complete the Accident and Illness Investigation Report (Form AR-1 in Appendix A) in the event of an accident, illness, or injury. A copy of this form must be forwarded to the HSR for use in determining whether the incident should be recorded and to be included in Tetra Tech's medical surveillance records.

8.0 ENVIRONMENTAL MONITORING AND SAMPLING

Environmental monitoring or sampling will be conducted to assess personnel exposure levels as well as site or ambient conditions and to establish appropriate levels of PPE. The following sections discuss initial and background air monitoring, personal monitoring, ambient air monitoring, monitoring parameters and devices, use and maintenance of survey equipment, thermal stress monitoring, and noise monitoring. Site-specific air monitoring requirements and action levels are provided in Table 8-1.

8.1 INITIAL AND BACKGROUND AIR MONITORING

Initial air monitoring of a typical work area will be performed at the beginning of the field sampling project to document airborne fiber levels in attic spaces that contain VCI or LV. Initial exposure assessments will be required for personnel who participate in the TAPE project. Personal air monitoring will be required during the initial phase of the TAPE to document airborne exposures. The assessments must be used to document typical exposures during specific types of field activities to establish the PPE

TABLE 8-1

SITE-SPECIFIC AIR MONITORING REQUIREMENTS AND ACTION LEVELS

Contaminant or Hazard	Task	Monitoring Device	Action Level	Monitoring Frequency	Action[a]
Asbestos	Tasks 1 and 2	Gilair-5 Air Sampler (personal)	<one half of PEL or TLV	Select locations – presence of friable asbestos	Results will be received the day after sampling. Work practices will be changed accordingly.

Notes:

< Less than
PEL Permissible exposure limit
TLV Threshold limit value
[a] Refer to Table 4-2 for specific types of gloves, chemical resistant clothing, respirators, and cartridges

required. This exposure assessment will be conducted for each two-person field sampling team. The exposure levels must be documented before the levels of PPE required during the work can be downgraded. The assessments must also be conducted using personal air sampling whenever there is a change in working conditions.

8.2 PERSONAL MONITORING

The employees working closest to a source of contamination have the highest likelihood of exposure to airborne contaminant concentrations that may exceed established exposure limits. Therefore, the workers who are closest to a source of contaminant generation will be selectively monitored during site activities. Personal monitoring will be conducted in the breathing zone and, if a worker is wearing respiratory protective equipment, outside the face piece. The breathing zone air will be monitored at select locations, such as in the presence of friable asbestos.

Air monitoring will be performed to calculate the airborne fiber concentration to ensure that employee exposure remains below the prescribed permissible exposure limit (PEL) or excursion limit. The worker's exposure will be measured by first collecting an air sample from within the breathing zone (within 12 inches from the nose) throughout an entire workshift. This measurement usually necessitates that workers wear the pump near the waist. The personal air monitoring will be evaluated based on the different work activities that are being conducted. A representative set of air samples will be collected during activities that represent typical field days during the TAPE.

The sampling pump flow rates will be between 0.5 liters/minute and 2.5 liters/minute when using a 25-millimeter cassette. Once this sample is analyzed, the results shall be used to calculate the average level of exposure during the complete workshift (the time weighted average, TWA). The TWA is calculated as follows:

$$TWA = \frac{C1\,T1 + C2\,T2 + C3\,T3}{T1 + T2 + T3}$$

T = sample times (duration of exposure in minutes or hours)
C = airborne asbestos fiber concentration (in fibers per cubic centimeter, f/cc)

The TWA results will then be used for comparison to the PEL and to evaluate compliance with permissible exposure limits as established by OSHA. They will also be used to dictate which type of respiratory protection is required to ensure that the PEL is not exceeded.

Personal air samples will also be collected and analyzed in the manner described above for comparison to the exposure limit. The samples will be collected for 30 minutes during operations.

8.3 MONITORING PARAMETERS AND DEVICES

The following sections below briefly describe the use and limitations of instruments used to monitor for asbestos, combustible atmospheres, percent oxygen, and particulates. Site-specific air monitoring requirements and action levels are listed in Table 8-1.

All monitors will be calibrated in accordance with manufacturer recommendations at the beginning of every workday, if possible. Calibration results along with air monitoring data will be recorded in the field logbook.

8.3.1 Asbestos

Air monitoring will be conducted selectively during sampling to provide information on exposure and identify the need for upgrades from level D PPE to level C PPE. In addition, air monitoring will be conducted to make certain that asbestos is not being released to the areas used by workers as a result of sampling.

Work during the TAPE will be initially conducted in level D PPE; however, level C PPE will be required whenever attic access is required or whenever VCI or LV is sampled. The action level for sampling activities is one-half the PEL (0.05 f/cc). Additionally, upgrade to level C PPE will also be based on the material sampled and at the discretion of the SSC. Personal air monitoring for particulates will be conducted and analyzed by a laboratory. Laboratory results will be received post exposure (less than 1 day) to assess sampling conditions and change PPE accordingly.

8.3.2 Particulates

Friable asbestos is anticipated to be encountered during sampling. Other particulates, such as mineral wood, fiberglass, and other insulating materials, may be encountered in attic areas but are not known.

Particulate air monitoring is the process of measuring the fiber content of a known volume of air collected during a specific period of time. The acceptable procedure for airborne asbestos measurement for personal exposure monitoring is phase contrast microscopy (PCM) using the OSHA reference method specified in Appendix A of 29 CFR 1926.1101. This NIOSH 7400 Method is also acceptable for measuring airborne fiber levels in area samples. The OSHA asbestos regulations, which contain the PEL, were written to regulate asbestos-related activities typically found within industrial or construction settings. OSHA assumes that, the majority of the airborne fibers in these settings will be asbestos. In line with this assumption, the OSHA PEL is based on total airborne fiber exposures and not specifically airborne asbestos fibers.

The acceptable procedure for airborne asbestos measurement by transmission electron microscopy (TEM) is the method EPA specified in 40 CFR 763, Appendix A to Subpart E, Interim Transmission Electron Microscopy Analytical Methods. TEM sampling provides greater analytical sensitivity and can differentiate between asbestos and non-asbestos fibers. TEM sampling will be limited during the TAPE. TEM samples will be collected only if PCM samples cannot be analyzed because of overloading from nuisance particulates, or when fibers must be differentiated.

8.4 USE AND MAINTENANCE OF SURVEY EQUIPMENT

All personnel using field survey equipment must have training in its operation, limitations, and maintenance. Maintenance and internal or electronic calibration will be performed in accordance with manufacturer recommendations by personnel who are familiar with the devices before they are used on site. Repairs, maintenance, and internal or electronic calibration of these devices will be recorded in an equipment maintenance logbook. Results of routine calibration will be recorded on daily air sampling data sheets.

8.5 THERMAL STRESS MONITORING

Heat stress and cold stress are common and serious threats at hazardous waste sites. SWPs 6-15 and 6-16 discuss heat and cold stress and include monitoring methods appropriate for the season and location of work (see Appendix B).

9.0 SITE CONTROL

Site control is an essential component in HASP implementation. The following sections discuss measures and procedures for site control, such as on-site communications, site control zones, site access control, site safety inspections, and SWPs.

9.1 ON-SITE COMMUNICATIONS

Successful communication between field teams and personnel is essential. The following communication systems will be available during site activities:

- Cellular telephones or two-way radios

The hand signals listed below will be used by site personnel in emergency situations or when verbal communication is difficult.

Signal	Definition
Hands clutching throat	Out of air or cannot breathe
Hands on top of head	Need assistance
Thumbs up	Okay, I am all right, or I understand
Thumbs down	No or negative
Arms waving upright	Send backup support
Gripping partner's wrist	Exit area immediately

9.2 SITE CONTROL ZONES

The following site control zones will be established for each property and work task.

9.2.1 Zone 1: Exclusion Zone

An exclusion zone includes areas where contamination is either known or likely to be present or, because of work activity, has the potential to cause harm to personnel. Typically, these areas will be limited to attics and crawl spaces during the TAPE. The exclusion zone will be established before Tetra Tech employees access attic and crawl space areas to collect samples. Other building occupants and visitors will be restricted from entering the exclusion zone during sampling procedures. Work tasks that may require establishment of an exclusion zone include the following:

Task 1– Interior sampling of VCI and LV in attics and crawl spaces.

Exclusion zones will not be established during collection of dust samples within other interior areas of buildings or during collection of soil samples outside the buildings. However, building occupants should be restricted from the immediate area during these procedures.

9.2.2 Zone 2: Decontamination Zone

Decontamination zones will be established during the TAPE project, such as at the base of ladders used to access attic spaces or outside of crawl space entrances. These areas will be covered with two layers of polyethylene sheeting during sampling in the exclusion zones. Personal decontamination will entail removing of protective garments after field crews descend from attic areas or exit crawl spaces. Tetra Tech personnel will use disposable wet wipes to wash respirators and exposed areas such as faces and hands. Sampling equipment will be decontaminated at the sample locations. Decontamination procedures will consist of a water rinse or damp rag cleaning of equipment after each sample collected. The decontamination zone will contain facilities to decontaminate personnel and portable equipment. Equipment decontamination procedures are described in Section 10.0. All PPE and polyethylene sheeting will be place in disposal bags and sealed before Tetra Tech employees exit the decontamination zones. After personal and equipment decontamination are complete and polyethylene sheeting removed, decontamination areas will be cleaned of debris and residue using appropriate HEPA vacuuming or wet

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cleaning procedures. Visitors including building occupants will not be permitted to enter the decontamination zone without proper qualifications and Tetra Tech SSC authorization.

9.2.3 Zone 3: Support Zone

A support zone may consist of any uncontaminated and nonhazardous part of the site, such as areas adjacent to decontamination zones at the base of ladders used to access attic spaces or outside of crawl space entrances. Sampling procedures will immediately stop if visible suspect asbestos-contaminated debris is observed outside of the sampling or decontamination areas at any time during sampling after the exclusion zone has been established. Debris and residue will be cleaned up using appropriate HEPA vacuuming or wet cleaning procedures before work recommences. Site visitors who do not meet training, medical surveillance, and PPE requirements must stay outside of the support zone.

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9.3 SITE ACCESS CONTROL

The study area during this project will not be one stationary location. Access to private residences will be permitted by the owner. Owners and occupants should be restricted from the immediate areas during sampling procedures. Typically, they should be asked to stay in adjacent rooms during sampling procedures.

9.4 SITE SAFETY INSPECTIONS

The Tetra Tech SSC will conduct periodic site safety inspections to maintain safe work areas and compliance with this HASP. Results of the site safety inspections will be recorded in the field logbook or on a Field Audit Checklist (Form AF-1 in Appendix A).

9.5 SAFE WORK PRACTICES

Various SWPs are applicable during the TAPE project. These SWPs are included in Appendix B to this HASP. The following SWPs apply to the site:

- SWP 6-1, General Safe Work Practices
- SWP 6-8, Safe Electrical Work Practices

- SWP 6-9, Fall Protection Practices
- SWP 6-10, Portable Ladder Safety
- SWP 6-15, Heat Stress
- SWP 6-16, Cold Stress
- SWP 6-27, Respirator Cleaning Procedures
- SWP 6-28, Safe Work Practices for Use of Respirators

10.0 DECONTAMINATION

Decontamination is the process of removing or neutralizing contaminants on personnel or equipment. When properly conducted, decontamination procedures protect workers from contaminants that may have accumulated on PPE, tools, and other equipment. Proper decontamination also prevents transport of potentially harmful materials to uncontaminated areas. Personnel and equipment decontamination procedures are described in the following sections.

10.1 PERSONNEL DECONTAMINATION

Personnel decontamination at the site will be limited by using disposable PPE whenever possible and by wet wiping of faces and hands after sampling procedures. Any personnel decontamination procedures will follow guidance in the *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities* (NIOSH and others 1985). Personnel and PPE will be decontaminated with potable water or a mixture of detergent and water. Disposable cloths or wet wipes will be placed in sealable baggies pending disposal.

10.2 EQUIPMENT DECONTAMINATION

Decontamination of all sampling, PPE, and field monitoring equipment used during site activities will be required. Decontamination of sampling equipment will be conducted at the sample locations. Decontamination procedures will consist of a water rinse or damp rag cleaning of equipment after each sample collected.

10.2.1 PPE and Monitoring Equipment

Used, disposable PPE will be collected in sealable containers and will be disposed of in accordance with procedures described in the project specific work plan. Personnel decontamination procedures may be modified as necessary while on site. All non-disposable PPE such as hard hats, respirators, and any exposed clothing will be washed at the end of each workday, or as necessary depending on working conditions, to remove all potential for asbestos contamination. Monitoring equipment used during sampling will be rinsed with water at the end of each workday, or as necessary to remove any contamination.

10.2.2 Sampling Equipment

Sampling equipment, such as knives and scissors, will be decontaminated before and after each use as described below.

- Decontamination procedures for sampling equipment will depend on the sampling location. Equipment such as knives and scissors will, in most sampling situations, be decontaminated by wiping down with damp cloths or rags. Soap and water may be necessary when items are excessively dirty but are not mandatory.
- Sampling equipment will be allowed to air-dry before the next use.

11.0 EMERGENCY RESPONSE PLANNING

This section describes emergency response planning procedures to be implemented for the site. This section is consistent with local, state, and federal disaster and emergency management plans. The following sections discuss pre-emergency planning, personnel roles and lines of authority, emergency recognition and prevention, evacuation routes and procedures, emergency contacts and notifications, hospital route directions, emergency medical treatment procedures, protective equipment failure, fire or explosion, weather-related emergencies, spills or leaks, emergency equipment and facilities, and reporting.

11.1 PRE-EMERGENCY PLANNING

All on-site employees will be trained in and reminded of the provisions of Section 11.0, site communication systems, and site evacuation routes during the prework briefing and daily tailgate safety meetings. The Tetra Tech SSC will review the emergency response provisions on a regular basis and will be revised, if necessary, to make certain that they are adequate and consistent with prevailing site conditions.

11.2 PERSONNEL ROLES AND LINES OF AUTHORITY

The Tetra Tech SSC has primary responsibility for responding to and correcting emergencies and for taking appropriate measures to maintain the safety of site personnel and the public. Possible actions may include evacuation of personnel from the site area. The SSC is also responsible for ensuring that corrective measures have been implemented, appropriate authorities have been notified, and follow-up reports have been completed.

Individual subcontractors are required to cooperate with the SSC, within the parameters of their scopes of work.

Personnel are required to report all injuries, illnesses, spills, fires, and property damage to the SSC. The SSC must be notified of any on-site emergencies and is responsible for following the appropriate emergency procedures described in this section.

11.3 EMERGENCY RECOGNITION AND PREVENTION

Table 4-1 lists potential on-site chemical hazards, and Table 4-2 provides information on the hazards associated with the various tasks planned for the site. On-site personnel will be made familiar with this information and with techniques of hazard recognition through prework training and site-specific briefings.

11.4 EVACUATION ROUTES AND PROCEDURES

In the event of an emergency that necessitates evacuation of a work task area or the site, the Tetra Tech SSC will contact all nearby personnel using the on-site communication systems discussed in Section 9.1

to advise the personnel of the emergency. The personnel will proceed along site roads to a safe distance upwind from the source of the hazard. The personnel will remain in that area until the SSC or an authorized individual provides further instructions.

11.5 EMERGENCY CONTACTS AND NOTIFICATIONS

The emergency information before Section 1.0 of this HASP provides names and telephone numbers of emergency contact personnel. This page must be posted on site or must be readily available at all times. In the event of a medical emergency, personnel will notify the appropriate emergency organization and will take direction from the Tetra Tech SSC. The project team will follow procedures discussed in Section 11.9 or 11.11.

11.6 HOSPITAL ROUTE DIRECTIONS

Before site activities begin, Tetra Tech personnel will conduct a pre-emergency hospital run to familiarize themselves with the route to the local hospital. A map showing the hospital route is provided in the emergency information before Section 1.0 of this HASP.

11.7 EMERGENCY MEDICAL TREATMENT PROCEDURES

A person who becomes ill or injured during work may require decontamination. If the illness or injury is minor, any decontamination necessary will be completed and first aid should be administered before the patient is transported. If the patient's condition is serious, partial decontamination will be completed (such as complete disrobing of the person and redressing the person in clean coveralls or wrapping in a blanket). First aid should be administered until an ambulance or paramedics arrive. All injuries and illnesses must be reported immediately to the Tetra Tech project manager and HSR.

Any person transported to a clinic or hospital for chemical exposure treatment will be accompanied by information on the chemical he or she has been exposed to at the site, if possible. Table 4-1 contains this information.

11.8 PROTECTIVE EQUIPMENT FAILURE

If any worker in the exclusion zone experiences a failure of protective equipment (either engineering controls or PPE) that affects his or her personal protection, the worker and all coworkers will immediately leave the exclusion zone. Re-entry to the exclusion zone will not be permitted until (1) the

protective equipment has been repaired or replaced, (2) the cause of the equipment failure has been determined, and (3) the equipment failure is no longer considered to be a threat.

11.9 FIRE OR EXPLOSION

In the event of a fire or explosion on site, fire department will be immediately summoned. The Tetra Tech SSC or a site representative will advise the fire department of the location and nature of any hazardous materials involved. Appropriate provisions of Section 11.0 will be implemented by site personnel.

11.10 WEATHER-RELATED EMERGENCIES

Work will not be conducted during severe weather conditions, including high-speed winds or lightning. In the event of severe weather, field personnel will stop work, secure and lower all equipment, and leave the site.

Thermal stress caused by excessive heat or cold may occur as a result of extreme temperatures, workload, or the PPE used. Heat and cold stress treatment will be administered as described in SWPs 6-15 and 6-16.

11.11 EMERGENCY EQUIPMENT AND FACILITIES

The following emergency equipment will be available on site:

- First aid kit
- Fire extinguisher
- Site telephones, depending on location
- Mobile telephone
- Confined-space entry equipment, as necessary
- Fall protection equipment, as necessary

11.12 REPORTING

All emergencies require follow-up and reporting. Appendix A includes the Tetra Tech Accident and Illness Investigation Report (Form AR-1). This report must be completed and submitted to the Tetra Tech project manager within 24 hours of an emergency. The project manager will review the report and then forward it to the Tetra Tech HSR for review. The report must include proposed actions to prevent similar incidents from occurring. The HSR must be fully informed of the corrective action process so that she may implement applicable elements of the process at other sites.

REFERENCES

American Conference of Governmental Industrial Hygienists (ACGIH). "Threshold Limit Values and Biological Exposure Indices for 1998." Latest edition.

National Institute for Occupational Safety and Health (NIOSH) and others. 1985. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*. October.

NIOSH. 1997. "Pocket Guide to Chemical Hazards." U.S. Department of Health and Human Services. U.S. Government Printing Office. Washington, DC. June.

Tetra Tech, Inc. 1999. "Health and Safety Manual."

APPENDIX A

TETRA TECH FORMS

(11 Sheets)

- Compliance Agreement (Form HSP-4)
- Daily Tailgate Safety Meeting (Form HST-2)
- Daily Site Log (Form SSC-1)
- Accident and Illness Investigation Report (Form AR-1)
- Field Audit Checklist (Form AF-1)

APPENDIX B

SAFE WORK PRACTICES

(38 Sheets)

- SWP 6-1 General Safe Work Practices
- SWP 6-9 Fall Protection Practices
- SWP 6-10 Portable Ladder Safety
- SWP 6-15 Heat Stress
- SWP 6-16 Cold Stress
- SWP 6-27 Respirator Cleaning Procedures
- SWP 6-28 Safe Work Practices for Use of Respirators

APPENDIX C

RESPIRATORY HAZARD ASSESSMENT (FORM RP-2)

(Two Sheets)

Note: This assessment form will be finalized if gasses or vapors are encountered and is not required for asbestos sampling.

ATTACHMENT D

MATERIAL SAFETY DATA SHEETS

(None Anticipated)

Troy, MT Inspection Field Form

Physical Address: _____

Property Identification Number: AD - _____

Building Number: BD - _____ (Insert at top right of each page of IFF)

Commercial or residential property (circle one)? Commercial Residential Both

Site visit date and time: _____

Field log book number and page: _____

Inspection team members: _____

Owner/primary contact providing access: _____

Phone number for primary contact: _____

Inspection Form	If Used, how many separate sheets	Not Used
Primary Structure Attic		
Primary Structure Living Space		
Primary Structure Understructure		
Primary Structure Utilities		
Exterior Inspection		
Secondary Structures		

Inspection Item	Value	Comments
PRIMARY STRUCTURE ATTIC (use a separate form for each separate attic space)		
Type of attic	Finished Unfinished	
Multiple attics?	Yes No Attics within attics	
Location of attic entries	Inside house Outside house None	*Sketch location on property map*
Number of attic entries	1 2 3 Other:____	
Type of attic entry	Stairs Door Removable panel Other: _____	*If unusual shape/size, please note*
Attic used for storage?	Yes No	*Brief description:*
Kneewalls present?	Yes No	
Areas behind kneewalls accessed?	Yes No	*If yes, describe access:*
Areas behind kneewalls used for storage?	Yes No	*Brief description:*
Is finished attic furnished?	Yes No	*Brief description:*
Factors impeding potential cleanup? (i.e., presence of support beams/exposed electrical wires/HVAC)	Yes No	*Brief description:*
General condition of ceiling and floors	Good Poor	
Can all areas in attic be accessed?	Yes No	
Are any areas in attic segregated into individual rooms?	Yes No	*Brief description:*

PRIMARY STRUCTURE ATTIC-Continued (use a separate form for each separate attic space)		
Attic shows evidence of physical damage?	Yes No	*Brief description:*
Attic shows evidence of water damage?	Yes No	*Brief description:*
Apparent structural condition of roof	Good Poor	
Any other structural concerns?		
VCI observed in attic?	Yes No	*Sketch on property map and describe:*
Depth of VCI in attic	_____ inches	
Square footage of area with VCI?	_____ square feet	
Items in attic in contact with VCI?	Yes No	*Brief description:*
Other insulation in attic?	Yes No	*Type: Fiberglass* *Cellulose* *Other* _____
VCI in interior walls?	Yes No Unknown	
VCI in exterior walls?	Yes No Unknown	
Other insulation in walls?	Yes No Unknown	*Type: Fiberglass* *Cellulose* *Other* _____
Is other insulation in contact with VCI?	Yes No	*Brief description:*
Is VCI visibly leaking into living space?	Yes No	*Brief description:*

PRIMARY STRUCTURE LIVING SPACE (use a separate form for each building level if additional detail is necessary)		
Number and type of room in building; furnished/unfurnished (not including attic)	Basement: Ground floor: First floor: Second floor: Other: _____	
Ceiling cracks as viewed from living space?	Yes No	*Sketch on property map*
Utility conduits in attic leading to living space?	Yes No	*Sketch on property map*
If yes, was VCI observed around conduits?	Yes No	
Is VCI visible in HVAC registers?	Yes No	
Vermiculite observed in houseplant soil?	Yes No	*Describe:*
Evidence of vermiculite used in building materials?	Yes No	*Describe:*

PRIMARY STRUCTURE UNDERSTRUCTURE (use a separate form if differing understructures for a single primary structure)		
Type of understructure	Basement Crawlspace Other: _____ None	
Access to understructure	Yes No	*Locations:*
VCI observed in understructure?	Yes No	

PRIMARY STRUCTURE UTILITIES (check all that apply)		
Heating system for primary structure:	Fuel Oil Electric Propane Wood Stove Other: _____	
Heating type:	Forced air Radiant heat	
Electrical shutoff system observed?	Breaker box Fuse box Other: _____	*Sketch on property map*
Water source	City water Private well Other: _____	

EXTERIOR INSPECTION		
Evidence of vermiculite used in building materials?	Yes No	
Visible vermiculite on property?	Yes No	*Sketch on property map*
Vegetation/cover *contaminated area only*	Grass None Other: _____	
Trees within contaminated area?	Yes No	*Locations, type and size:*
Shrubs within contaminated area?	Yes No	*Locations, type and size:*
Fence present within contaminated area?	Yes No	*Describe:*
Items located on contaminated area?	Yes No	*Describe:*
Number of flowerbeds that have visible vermiculite in soil?		*Sketch on property map*
Contaminated flowerbeds contain flowers/plants?	Yes No	*Describe:*
Number of gardens that have visible vermiculite in soil?		*Sketch on property map*
Garden contains crops?	Yes No	*Describe:*
Type of driveway:	Concrete Gravel Asphalt Soil Other _____ None	

EXTERIOR INSPECTION-Continued		
Visual evidence of contamination in driveway?	Yes No	*Describe:*
If visual evidence of contamination, approximate dimensions:	Length _____ feet Width _____ feet	
Vermiculite observed in flower pots/ hanging baskets?	Yes No	*Sketch on property map*
Evidence of fill material on property?	Yes No	*Sketch on property map*
Any underground utilities visible or known to be present?	Yes No	*Describe and sketch on property map:*
Any aboveground utilities observed?	Yes No	*Describe and sketch on property map:*

SECONDARY STRUCTURES (use a separate page for each secondary structure)		
Secondary structures present?	Shed Deck Carport Garage Barn Greenhouse Other: _____	
VCI observed inside secondary structures?	Yes No	*Describe:*
Other insulation in secondary structures?	Yes No Unknown	*Type: Fiberglass* *Cellulose* *Other* _____
Is other insulation in contact with VCI?	Yes No	
Secondary structure finished or used for storage?	Finished Unfinished Storage Vacant Other _____	*Brief description:*
Items in secondary structure in contact with VCI?	Yes No	*Brief description:*
Visual evidence of contamination beneath secondary structures?	Yes No	*Describe:*

PHOTOGRAPH LOG:

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ADDITIONAL INFORMATION:

Troy, MT Inspection Field Form

Physical Address: _____

Property Identification Number: AD - _____

Building Number: BD - _____ (Insert at top right of each page of IFF)

Commercial or residential property (circle one)? Commercial Residential Both

Site visit date and time: _____

Field log book number and page: _____

Inspection team members: _____

Owner/primary contact providing access: _____

Phone number for primary contact: _____

Inspection Form	If Used, how many separate sheets	Not Used
Primary Structure Attic		
Primary Structure Living Space		
Primary Structure Understructure		
Primary Structure Utilities		
Exterior Inspection		
Secondary Structures		

Inspection Item	Value	Comments
PRIMARY STRUCTURE ATTIC (use a separate form for each separate attic space)		
Type of attic	Finished Unfinished	
Multiple attics?	Yes No Attics within attics	
Location of attic entries	Inside house Outside house None	*Sketch location on property map*
Number of attic entries	1 2 3 Other:____	
Type of attic entry	Stairs Door Removable panel Other: _____	*If unusual shape/size, please note*
Attic used for storage?	Yes No	*Brief description:*
Kneewalls present?	Yes No	
Areas behind kneewalls accessed?	Yes No	*If yes, describe access:*
Areas behind kneewalls used for storage?	Yes No	*Brief description:*
Is finished attic furnished?	Yes No	*Brief description:*
Factors impeding potential cleanup? (i.e., presence of support beams/exposed electrical wires/HVAC)	Yes No	*Brief description:*
General condition of ceiling and floors	Good Poor	
Can all areas in attic be accessed?	Yes No	
Are any areas in attic segregated into individual rooms?	Yes No	*Brief description:*

PRIMARY STRUCTURE ATTIC-Continued (use a separate form for each separate attic space)		
Attic shows evidence of physical damage?	Yes No	*Brief description:*
Attic shows evidence of water damage?	Yes No	*Brief description:*
Apparent structural condition of roof	Good Poor	
Any other structural concerns?		
VCI observed in attic?	Yes No	*Sketch on property map and describe:*
Depth of VCI in attic	_____ inches	
Square footage of area with VCI?	_____ square feet	
Items in attic in contact with VCI?	Yes No	*Brief description:*
Other insulation in attic?	Yes No	*Type: Fiberglass* *Cellulose* *Other* _____
VCI in interior walls?	Yes No Unknown	
VCI in exterior walls?	Yes No Unknown	
Other insulation in walls?	Yes No Unknown	*Type: Fiberglass* *Cellulose* *Other* _____
Is other insulation in contact with VCI?	Yes No	*Brief description:*
Is VCI visibly leaking into living space?	Yes No	*Brief description:*

PRIMARY STRUCTURE LIVING SPACE (use a separate form for each building level if additional detail is necessary)		
Number and type of room in building; furnished/unfurnished (not including attic)	Basement: Ground floor: First floor: Second floor: Other: _____	
Ceiling cracks as viewed from living space?	Yes No	*Sketch on property map*
Utility conduits in attic leading to living space?	Yes No	*Sketch on property map*
If yes, was VCI observed around conduits?	Yes No	
Is VCI visible in HVAC registers?	Yes No	
Vermiculite observed in houseplant soil?	Yes No	*Describe:*
Evidence of vermiculite used in building materials?	Yes No	*Describe:*

PRIMARY STRUCTURE UNDERSTRUCTURE (use a separate form if differing understructures for a single primary structure)		
Type of understructure	Basement Crawlspace Other: _____ None	
Access to understructure	Yes No	*Locations:*
VCI observed in understructure?	Yes No	

PRIMARY STRUCTURE UTILITIES (check all that apply)		
Heating system for primary structure:	Fuel Oil Electric Propane Wood Stove Other: _____	
Heating type:	Forced air Radiant heat	
Electrical shutoff system observed?	Breaker box Fuse box Other: _____	*Sketch on property map*
Water source	City water Private well Other: _____	

EXTERIOR INSPECTION		
Evidence of vermiculite used in building materials?	Yes No	
Visible vermiculite on property?	Yes No	*Sketch on property map*
Vegetation/cover *contaminated area only*	Grass None Other: _____	
Trees within contaminated area?	Yes No	*Locations, type and size:*
Shrubs within contaminated area?	Yes No	*Locations, type and size:*
Fence present within contaminated area?	Yes No	*Describe:*
Items located on contaminated area?	Yes No	*Describe:*
Number of flowerbeds that have visible vermiculite in soil?		*Sketch on property map*
Contaminated flowerbeds contain flowers/plants?	Yes No	*Describe:*
Number of gardens that have visible vermiculite in soil?		*Sketch on property map*
Garden contains crops?	Yes No	*Describe:*
Type of driveway:	Concrete Gravel Asphalt Soil Other _____ None	

EXTERIOR INSPECTION-Continued		
Visual evidence of contamination in driveway?	Yes No	*Describe:*
If visual evidence of contamination, approximate dimensions:	Length _____ feet Width _____ feet	
Vermiculite observed in flower pots/ hanging baskets?	Yes No	*Sketch on property map*
Evidence of fill material on property?	Yes No	*Sketch on property map*
Any underground utilities visible or known to be present?	Yes No	*Describe and sketch on property map:*
Any aboveground utilities observed?	Yes No	*Describe and sketch on property map:*

SECONDARY STRUCTURES (use a separate page for each secondary structure)		
Secondary structures present?	Shed Deck Carport Garage Barn Greenhouse Other: _____	
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Other insulation in secondary structures?	Yes No Unknown	*Type: Fiberglass* *Cellulose* *Other* _____
Is other insulation in contact with VCI?	Yes No	
Secondary structure finished or used for storage?	Finished Unfinished Storage Vacant Other _____	*Brief description:*
Items in secondary structure in contact with VCI?	Yes No	*Brief description:*
Visual evidence of contamination beneath secondary structures?	Yes No	*Describe:*

PHOTOGRAPH LOG:

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ADDITIONAL INFORMATION:

Montana Department of Environmental Quality
Remediation Division/Federal Superfund Section
1100 North Last Chance Gulch
PO Box 200901
Helena MT 59620-0901
406.841.5040 or 1.800.246.8198

Receipt for Samples

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9604(e) authorizes the Montana Department of Environmental Quality (DEQ), its officers, employees and representatives access to inspect and obtain samples from surface and subsurface soils or water (including groundwater) from the property identified below. This investigation authority extends to any facility, establishment or other place or property where any hazardous substance, pollutant or contaminant may be or has been generated, stored, treated, placed, disposed of, transported from or has otherwise come to be located or from which there has been or may be a release or threatened release or where entry is needed to determine the need for response, the appropriate response or to effectuate a response.

Property Owner/Operator Information:

Name: _____

Physical Address of property under investigation:_____

Mailing Address: _____

Phone (optional):_____

The following samples have been collected from this property:

Date	Media	Sample ID Number	Analysis to be performed

The above referenced samples have been collected in accordance with a sampling and analysis plan:

- ❑ Without variation; or
- ❑ With the following variation(s) from the plan:

  _____
  _____

The property owner/operator was offered a portion of the samples taken (split samples) at the person's cost. The property owner/operator elected to:

- ❑ Accept a split sample; or
- ❑ Decline a split sample.

DEQ will mail the sampling results to the person identified above when they become available.

Copy of this receipt provided to property owner/operator.

DEQ representative:

_____ CATHERINE LeCOURS
Signature Printed Name

Date:_____

Property owner/operator copy = white DEQ copy = yellow

Montana Department of Environmental Quality
Remediation Division/Federal Superfund Section
1100 North Last Chance Gulch
PO Box 200901
Helena MT 59620-0901
406.841.5040 or 1.800.246.8198

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DEQ representative:

_____ CATHERINE LeCOURS
Signature Printed Name

Date:_____

Property owner/operator copy = white DEQ copy = yellow